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BIG BLACK RIVER, MISSISSIPPI COMPREHENSIVE BASIN STUDY. VOLUME --ETC(U)
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Annex H- Hydroelectric Power

Annex I- Role of the State of Mississippi in the Planning and Development of the Water and Related Land Resources

Annex J- Transcripts of Public Hearings

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BIG BLACK RIVER BASIN COORDINATING COMMITTEE

APRIL 1968

BIG BLACK RIVER COMPREHENSIVE BASIN STUDY

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COMPREHENSIVE BASIN STUDY.

Volume IV.

Annex H, I, J.

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ANNEX H
HYDROELECTRIC POWER REPORT

Prepared by
FEDERAL POWER COMMISSION
Fort Worth Regional Office
Fort Worth, Texas
April 1968

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SECTION I - INTRODUCTION

1. SCOPE

A logical market area for hydroelectric power developed in the Big Black River Basin was determined and factors related to power marketing were analyzed. The analysis included past power requirements and estimated future requirements in the market area for the years 1970, 1980, 2000, and 2020; existing power supply facilities; scheduled changes in existing facilities; and additional generating capacity including hydroelectric capacity required to meet the estimated future demands in the market area.

2. OBJECTIVES

The objective of this appendix which includes a presentation of existing power supply and the need of additional power supply sources to serve the estimated future power requirements, is to determine if the potential hydroelectric development in the Big Black River Basin is feasible and would be applicable to the estimated future power loads in the market area while adhering to the long-range basin plans for developing the water and land related resources.

3. RELATIONSHIP TO OTHER APPENDIXES

This report on the Big Black River Basin deals with a multiple-purpose development of the undeveloped water and land-related resources in the basin. Hydroelectric power development in the basin is primarily associated with multiple-purpose reservoir development and is therefore subject to priorities of water use as well as to financial considerations. It follows that close coordination with project purposes described in the other appendixes is necessary.

4. PREPARATION AND COORDINATION OF APPENDIX

The inventory of power resources and needs in the market area was compiled by the Fort Worth regional office staff of the Federal Power Commission. Screening of potential hydroelectric projects in the Big Black River Basin and study of projects for power in the basin plan was the responsibility of the Vicksburg District of the Corps of Engineers. There was an exchange of ideas in all phases of the compilation participated in by representatives of the Vicksburg District of the Corps of Engineers, and the Federal Power Commission.

5. TYPES OF POWER DEVELOPMENTS CONSIDERED

Studies for development of hydroelectric power in the basin were concentrated on the addition of power as an added function at proposed multiple-purpose projects. The characteristic low head at these sites, combined with the priority of other water uses, precludes the economic

feasibility of a power installation at these sites. One site holds some potential in the long range plan of development, dependent upon development in purposes additional to the power function.

There are no worthy sites for consideration as pumped-storage developments.

SECTION II - MARKET AREA AND POWER REQUIREMENTS OF COORDINATION STUDY AREA K

6. DESCRIPTION OF MARKET AREA

a. General

Power supply areas as established by the Federal Power Commission for power market surveys, hydroelectric power need and utilization studies, and other analyses of power supply and requirements comprise geographical areas substantially representing the electrical service areas of major electric utilities. Usually a power supply area encompasses a combination of utilities that operate in close coordination under a common holding company or under other pooling arrangements. In the development of the National Power Survey, power supply areas were combined into coordination study areas to facilitate studies of extra-high-voltage transmission, coal-field steam-electric generating stations, the more adequate utilization of hydroelectric capacities, and other broad factors affecting the future development of the electric utility industry.

Coordination Study Area K; which includes Power Supply Areas 25, 29, 33, 34 and 35; is a logical combination of power supply areas inasmuch as it substantially represents the area covered by the Southwest Power Pool and associated systems. Through varying degrees of coordinated operations, these systems share reserves, provide mutual assistance in emergencies, stagger construction of new generating capacity, participate jointly in the financing and construction of large sized units, construct long EHV transmission facilities, jointly arrange large seasonal diversity interchanges, make maximum utilization of peaking hydroelectric capacity, and improve service reliability. Coordination Study Area K, therefore, is the logical market area for future hydroelectric power development in the Big Black River Basin. Plate 1 shows the location and extent of Coordination Study Area K.

Study Area K in itself represents an adequate and suitable market for determination of needs for future hydroelectric capacity that may be constructed in the Big Black River Basin. Exports and imports of seasonal diversity with TVA and the export and import of seasonal diversity based on hydraulic diversity between the Missouri River and Arkansas-White-Red Rivers are recognized in need and utilization studies. Other exports and imports affecting Study Area K are approximately offsetting.

b. Population

The population in the power supply areas comprising Coordination Study Area K, the designated market area, is an important factor in electric energy consumption and according to the July 1960 Census is as follows:

Population in Thousands of Persons

| <u>Power Supply Area</u> | <u>Farm</u> | <u>Non-Farm</u> | <u>Total</u> |
|----------------------------------|-------------|-----------------|--------------|
| 25 | 803 | 3,787 | 4,590 |
| 29 | 247 | 882 | 1,129 |
| 33 | 452 | 2,855 | 3,307 |
| 34 | 282 | 1,184 | 1,466 |
| 35 | <u>213</u> | <u>1,678</u> | <u>1,891</u> |
| Coordination Study Area K | 1,997 | 10,386 | 12,383 |

Population estimates prepared by the Bureau of Census were adapted to power supply areas and utilized extensively in the development of the electric load forecasts prepared for the National Power Survey which are a basis of the load forecasts presented in this report. Actual and estimated farm and non-farm population as related to other multiple purposes in the Big Black River Basin comprehensive study are presented in the economic base study prepared principally by the Corps of Engineers, U. S. Department of Agriculture, and Bureau of Mines.

Concentrations of population and industrial loads centralize electric loads in various areas. These load centers are often located along major water routes and at tidewater. The principal load centers in Study Area K, along with their actual 1960 and estimated 1970 and 1980 megawatt-load requirements including 12 percent reserve, are as follows:

| Power Supply Area | Load Center Area | Capacity Requirements (mw) (Peak Load plus 12% Reserve) | | |
|-------------------------|----------------------|--|-------|-------|
| | | 1960 | 1970 | 1980 |
| 25 | Jackson, Miss. | 325 | 704 | 1,404 |
| | Little Rock, Ark. | 644 | 1,395 | 2,782 |
| | Monroe, La. | 226 | 489 | 976 |
| | New Orleans, La. | 964 | 2,085 | 4,161 |
| 29 | Great Bend, Kan. | 272 | 538 | 952 |
| | Topeka, Kan. | 393 | 773 | 1,378 |
| 33 | Oklahoma City, Okla. | 771 | 1,624 | 2,766 |
| | Shreveport, La. | 588 | 1,243 | 2,117 |
| | Tulsa, Okla. | 637 | 1,344 | 2,296 |
| | Fort Smith, Ark. | 237 | 493 | 851 |
| 34 | Springfield, Mo. | 394 | 805 | 1,456 |
| | Wichita, Kan. | 486 | 995 | 1,803 |
| 35 | Baton Rouge, La. | 511 | 1,429 | 3,191 |
| | Beaumont, Tex. | 408 | 1,146 | 2,556 |
| | Lake Charles, La. | 263 | 732 | 1,636 |

c. Economic Features

The comprehensive economic base study, as noted previously, presents a detailed analysis of the many factors which affect the multiple purpose river basin development. Presented herein are some of the economic highlights that affect the electrical load growth in the designated market area. The energy requirements for farms ranged from 3,532 kwh per customer in PSA 25 to 6,509 kwh per customer in PSA 29 in 1965. This variation is closely related to the productivity of the soil, the type of farm, climate, characteristics of the farm population and price of competing fuels. Non-farm residential electric energy consumption in 1965 ranged from 3,909 kwh per home in PSA 29 to 5,261 kwh in PSA 35. Recent gains in residential consumption can be attributed to increasing acceptance of all types of refrigeration, air conditioning, and heating equipment, as well as to more extensive use of other appliances. Electric energy consumption per commercial outlet ranged from 20,998 kwh per customer in PSA 34 to 26,392 kwh per customer in PSA 35. Commercial utilization of electricity per customer is affected by the present high saturation of air conditioning, diversification of retail outlets, the advent of shopping centers, the expansion of electric cooking, and increasing recreational activities.

The industrial development and associated electric growth in Study Area K has been principally affected by the phenomenal growth of the petrochemical industry along the Gulf Coast where plentiful raw materials, water, pipelines, low fuel costs, lower construction costs, lower labor costs, and

water transportation are available. Petroleum refining is growing moderately but is substantially stable. The continued development and diversification in chemicals and plastics presents a bright future, particularly in the southern portion of Study Area K. The growing need for pulp and paper is expected to enhance electric load growth due to the primary and secondary influences of the development of new paper processing industries in the forested regions of Study Area K. The mineral industry in many areas provides a growing demand for power although in some areas the deposits are marginal or limited. It is not expected that the light metal industries will greatly expand future electric load growth due to the limited supplies of bauxite for the aluminum industry and the general practice of self-generation in the magnesium industry. Growth is expected in the aircraft industry, space industry, and in food processing, cement, fertilizer, and small appliance industries.

7. PAST AND ESTIMATED FUTURE POWER REQUIREMENTS

a. Annual

There is presented in Table 1 historical and estimated future data on energy for load, peak demands, and annual load factors for the power supply areas encompassed by Coordination Study Area K. It is to be noted that the peak demand for Area K increased from 2,890 mw in 1950 to 13,070 mw in 1965. Estimated future load growth as developed for the National Power Survey, issued in 1964, is expected to reach 35,900 mw by 1980. This estimate has been trended to the year 2020 for the Big Black River Basin comprehensive study and the expected load at that time is estimated at 182,000 mw.

Table 1 also demonstrates the decrease in annual load factors between 1950 and 1965 due principally to the advent of residential and commercial air conditioning. This trend appears to be reversing at this time and moderate increases in load factors are expected in the future due partly to load building activities of the electric utility industry.

The estimated power requirements shown in Table 1 are closely related to many of the economic factors of the market area. The power requirements are developed by classes of sales and combined into a total area requirement. The classes of service projected separately are farm, non-farm residential, commercial, industrial, irrigation, street lighting, electrified transportation, other sales, and losses. Expected farm usage is related to trends of cash receipts from farm marketings, expected trends in numbers of farms, and consideration of the types of farms, including commercial farming. Residential load projections, in addition to being closely related to population, are determined on the basis of the appliance saturation factors, average annual energy consumption of appliances and other home uses of electrical energy.

Table 1

Study Area K - Energy for Load, Peak Demand, and Annual Load

| <u>Power Supply Area</u> | <u>Energy for Load</u> (million kwh) | <u>Peak Demand</u> (megawatts) | <u>Annual Load Factor</u> (%) | <u>Peak Month</u> | <u>Energy for Load</u> (million kwh) | <u>Peak Demand</u> (megawatts) | <u>Annual Load Factor</u> (%) | <u>Peak Month</u> |
|----------------------------------|---|---------------------------------------|--|-----------------------|---|---------------------------------------|--|-----------------------|
| | 1950 | | | | 1955 | | | |
| 25 | 5,438 | 995 | 62.4 | Sept. | 10,332 | 1,886 | 62.5 | Sept. |
| 29 | 1,467 | 304 | 55.1 | Dec. | 2,437 | 519 | 53.6 | Aug. |
| 33 | 3,846 | 751 | 51.2 | Aug. | 6,911 | 1,477 | 53.4 | Jul. |
| 34 | 1,955 | 379 | 58.9 | Dec. | 3,384 | 672 | 57.5 | Aug. |
| 35 | 2,696 | 461 | 66.8 | Sept. | 4,455 | 793 | 64.1 | Aug. |
| Area K | 15,402 | 2,890 | 60.8 | | 27,519 | 5,347 | 58.8 | |
| | 1965 | | | | 1970 | | | |
| 25 | 21,049 | 4,318 | 55.7 | July | 30,800 | 6,390 | 55.0 | Aug. |
| 29 | 5,235 | 1,196 | 50.0 | July | 7,320 | 1,580 | 53.0 | Aug. |
| 33 | 15,833 | 3,642 | 49.6 | July | 22,360 | 5,000 | 51.0 | Aug. |
| 34 | 7,285 | 1,570 | 53.0 | July | 10,440 | 2,250 | 53.0 | Aug. |
| 35 | 13,285 | 2,344 | 64.7 | July | 22,350 | 4,080 | 62.5 | Aug. |
| Area K | 62,687 | 13,070 | 54.8 | | 93,270 | 19,300 | 55.2 | |
| | 2000 | | | | 2020 | | | |
| Area K | 462,000 | 93,000 | 56.7 | Aug. | 904,000 | 182,000 | 56.7 | Aug. |

Table 1for Load, Peak Demand, and Annual Load Factor

| <u>Energy for Load</u> (million kwh) | <u>Peak Demand</u> (megawatts) | <u>Annual Load Factor</u> (%) | <u>Peak Month</u> | <u>Energy for Load</u> (million kwh) | <u>Peak Demand</u> (megawatts) | <u>Annual Load Factor</u> (%) | <u>Peak Month</u> |
|---|---------------------------------------|--|-----------------------|---|---------------------------------------|--|-----------------------|
| <u>1955</u> | | | | <u>1960</u> | | | |
| 10,332 | 1,886 | 62.5 | Sept. | 13,222 | 2,688 | 56.0 | July |
| 2,437 | 519 | 53.6 | Aug. | 3,563 | 793 | 51.2 | Aug. |
| 6,911 | 1,477 | 53.4 | July | 10,456 | 2,353 | 50.6 | July |
| 3,384 | 672 | 57.5 | Aug. | 5,017 | 1,056 | 54.1 | Aug. |
| 4,455 | 793 | 64.1 | Aug. | 7,949 | 1,462 | 61.9 | July |
| 27,519 | 5,347 | 58.8 | | 40,207 | 8,352 | 54.8 | |
| <u>1970</u> | | | | <u>1980</u> | | | |
| 30,800 | 6,390 | 55.0 | Aug. | 60,000 | 11,610 | 59.0 | Aug. |
| 7,320 | 1,580 | 53.0 | Aug. | 12,850 | 2,770 | 53.0 | Aug. |
| 22,360 | 5,000 | 51.0 | Aug. | 37,850 | 8,470 | 51.0 | Aug. |
| 10,440 | 2,250 | 53.0 | Aug. | 18,200 | 3,920 | 53.0 | Aug. |
| 22,350 | 4,080 | 62.5 | Aug. | 50,000 | 9,130 | 62.5 | Aug. |
| 93,270 | 19,300 | 55.2 | | 178,900 | 35,900 | 56.7 | |
| <u>2020</u> | | | | | | | |
| 04,000 | 182,000 | 56.7 | Aug. | | | | |

2

Area economics, such as income guidelines, provide correlative data in establishing residential growth. Commercial sales projections are mathematically related to population projections and past trends of energy consumption. General area development guides help establish future expected commercialization. Industrial projections are predicated on a judgment basis after careful consideration of the value of mineral products, mineral reserves, value added by manufacture, industrial growth, electric loads as reported by the electric utilities, and the area potential for future industrialization.

There is presented on Figure 1 a graphical representation of the actual and estimated future classified sales projections from 1950 to 1980 with the total requirements extended from 1980 to 2020. The "all other" category includes irrigation and drainage pumping, electrified transportation, street lighting, and other minor uses. These data are related to historical trends that have been recorded by the Federal Power Commission since annual electric utility reporting was initiated prior to 1940. The future trends are predicated from historical data with careful observation of the various area and economic factors discussed in previous sections. Consideration is given to other sources of energy and their price relationships. Table 2 presents tabular data supporting Figure 1.

Table 2

Study Area K - Classified Sales

| | Year | | | | | |
|-----------------------------|------------------------------|------------------------------|------------------------------|-------------|-------------|-------------|
| | <u>1950</u> | <u>1955</u> | <u>1960</u> (million kwh) | <u>1965</u> | <u>1970</u> | <u>1980</u> |
| Farm | 860 | 1,321 | 1,507 | 1,783 | 2,285 | 3,150 |
| Irrigation and Drainage | | | | | | |
| Pumping | 12 | 71 | 214 | 163 | 262 | 370 |
| Non-Farm Residential | 2,453 | 5,039 | 9,364 | 15,737 | 23,290 | 46,500 |
| Commercial | 2,673 | 4,412 | 7,482 | 11,576 | 16,170 | 20,040 |
| Industrial | 6,391 | 12,031 | 15,419 | 24,277 | 37,670 | 76,440 |
| Street Lighting | 148 | 250 | 379 | 552 | 841 | 1,540 |
| Electrified Transportation | 58 | 47 | 36 | 7 | 6 | 0 |
| All Other | 708 | 1,140 | 1,557 | 2,641 | 3,396 | 5,570 |
| Total to Ultimate Customers | 13,303 | 24,311 | 35,958 | 56,736 | 83,920 | 161,610 |
| Losses | 2,099 | 3,208 | 4,249 | 5,951 | 9,350 | 17,290 |
| Required Energy for Load | 15,402 | 27,519 | 40,207 | 62,687 | 93,270 | 178,900 |
| Required Energy for Load | <u>2000</u> (million kwh) | <u>2020</u> (million kwh) | | | | |
| | 462,000 | 904,000 | | | | |

b. Monthly

The estimated 1980 monthly energy requirements, peak demands, and load factors in the market area are as follows:

| Month | Energy Requirements | | Peak Demand | | Load Factor |
|--------|---------------------|-------|-------------|------------|-------------|
| | (million kwh) | (%) | (mw) | (% annual) | (%) |
| Jan. | 14,250 | 8.0 | 25,940 | 72.3 | 73.8 |
| Feb. | 12,350 | 6.9 | 24,660 | 68.7 | 72.0 |
| Mar. | 12,890 | 7.2 | 23,240 | 64.7 | 74.5 |
| Apr. | 12,580 | 7.0 | 24,250 | 67.5 | 72.1 |
| May | 14,310 | 8.0 | 28,370 | 79.0 | 67.8 |
| June | 16,210 | 9.1 | 33,410 | 93.1 | 67.4 |
| July | 18,280 | 10.2 | 35,400 | 98.6 | 69.4 |
| Aug. | 18,610 | 10.4 | 35,900 | 100.0 | 69.7 |
| Sept. | 16,370 | 9.2 | 33,690 | 93.8 | 67.5 |
| Oct. | 14,570 | 8.1 | 28,600 | 79.7 | 68.5 |
| Nov. | 13,530 | 7.5 | 26,440 | 73.6 | 71.1 |
| Dec. | 14,950 | 8.4 | 28,140 | 78.4 | 71.4 |
| Annual | 178,900 | 100.0 | 35,900 | 100.0 | 56.7 |

Air conditioning loads cause a peak season of power requirements in June, July, August, and September and the annual peak demand usually occurs in the first week of August. Daily peaks occur in the early afternoon as shown on the weekly curve illustrating the operation of pumped-storage projects (Figure 6). Growing loads will create a demand for large amounts of peaking capacity which hydroelectric plants are admirably suited to supply. A few plants having large amounts of storage can be operated at annual plant factors as low as five percent, provided water can be used as needed during the peak-load season.

8. EXISTING POWER SUPPLY FACILITIES

This section briefly describes the facilities of the principal electric utility systems that are involved in developing the supply of power for future loads in the market area. In analyzing the area power supply, there is presented herein a description of the Southwest Power Pool, its components, pooling arrangements, area transmission, summaries of plant capacities, industry-owned generation, diversity transfers, generating unit retirements and scheduled steam-electric plant additions in the larger sizes.

a. Utility Systems

In Coordination Study Area K, the designated market for hydroelectric capacity in the Big Black River Basin, most of the principal electric utilities are members of the Southwest Regional Group which is one of the four parts of the Interconnected System Group covering the midwest and south-eastern United States. The Southwest Regional Group is a voluntary non-contractual organization of some 55 electric utilities from the Nebraska-

South Dakota state line to the Gulf of Mexico and from New Mexico to central Mississippi. The Group sets policies, procedures, and operating regulations for the members. Within the Southwest Regional Group, the Southwest Power Pool and associated systems, comprised of 17 investor-owned and 8 non-investor owned systems, has a service area of approximately 350,000 square miles and includes all of the principal electric utilities in Study Area K and two systems in Study Area L, Nebraska. A list of the members in Study Area K is as follows:

Middle South Utilities & Ark-Mo Power Company 1/
Arkansas Power & Light Company 2/
Louisiana Power & Light Company 2/
Mississippi Power & Light Company 2/
New Orleans Public Service Inc. 2/
Arkansas-Missouri Power Company
Gulf States Utilities Company 2/
Central Louisiana Electric Company 2/
Southwestern Power Administration 4/6/

Public Service Company of Oklahoma 2/
Oklahoma Gas & Electric Company 2/
Southwestern Electric Power Company 2/
Grand River Dam Authority
Arkansas Electric Cooperative Corp.
Western Farmers Electric Cooperative

The Empire District Electric Company 2/3/4/
Missouri Public Service Company 3/4/
Kansas Gas & Electric Company 2/3/
The Kansas Power & Light Company 3/
Western Light & Telephone Company
Central Kansas Power Company
Missouri Utilities Company
City Utilities of Springfield, Missouri
Associated Electric Cooperatives, Inc. 4/
N.W. Electric Power Cooperatives, Inc. 5/
Central Electric Power Cooperative 5/
Northeast Missouri Electric Power Cooperative 5/
M&A Electric Power Cooperative 5/
Sho-Me Power Corporation 5/
KAMO Electric Power Cooperative 5/

(Footnotes are on following page)

- 1/ Generally known as the Middle South Integrated System pool.
- 2/ Component of the South Central Electric Companies pool.
- 3/ Component of the Missouri-Kansas Pool, which also includes the Kansas City Power & Light not listed above.
- 4/ Component of the Missouri Integration Pool, which includes the Kansas City Power & Light not listed above.
- 5/ Component of the Associated Electric Coop.
- 6/ The Missouri Integration Pool covered by Footnote 4 has an agreement with SPA covering hydro peaking capacity, etc.

The Southwest Power Pool maintains headquarters in Little Rock, Arkansas. The pool was created in the early part of World War II to provide an adequate and continuous supply of electric power and energy for civil and defense requirements. Within the Southwest Power Pool, the Middle South integrated system, as noted above, coordinates planning, interchanges economy energy, exchanges firm power and energy, provides emergency assistance, and coordinates maintenance schedules. A central dispatcher at Pine Bluff, Arkansas, schedules hourly generation on the integrated system based on incremental cost and losses by the use of an automatic dispatch computer.

There has recently been negotiated, principally by utilities within the Southwest Power Pool, the Missouri Integration Agreement, whereby 478,000 kw of hydroelectric peaking capacity from White River hydroelectric projects is marketed by the Southwestern Power Administration under long-term contracts to Associated Electric Cooperative (see six AEC members noted in above list) and three privately owned electric utilities; i.e. Kansas City Power & Light Company, Missouri Public Service Company, and the Empire District Electric Company. The Missouri-Kansas (Mo-Kan) Participation Agreement, as noted in footnote 3 of the above list, is a formal pooling arrangement whereby large new generating units will be constructed on a participation arrangement and 345-kv transmission will be made possible by the resulting savings. The participants' system reserves may be adjusted to a 10 percent fixed minimum base under the contract. Contractual arrangements have been created whereby peaking hydro generation available from SPA will be integrated into the systems to the considerable advantage of all participants.

As was noted in footnote 2 of the above list, the 11 members of South Central Electric Companies (SCEC) have negotiated for a seasonal diversity exchange with TVA beginning with 435 mw in 1965 and increasing to 1,500 mw by the winter of 1968-1969. It is the intent of all parties to utilize diversity to the maximum extent and to take full advantage of the associated EHV transmission for other system operating savings. SCEC has a headquarters in Little Rock, Arkansas, for scheduling of power flows, loss determinations, reserve analyses, and other studies. Public Service Company of Oklahoma and Southwestern Electric Power Company are members of the Central and Southwest Corporation system but free interchange with the other two members of the system in Texas (West Texas Utilities Company and Central Power & Light Company) is prevented by restrictions imposed to maintain the intrastate status of several Texas companies.

The larger electric utilities operating in the confines of the Big Black River Basin, as shown on the attached transmission map, plate 2, are the Tennessee Valley Authority and the Mississippi Power and Light Company.

Coordination Study Area K is blanketed by a grid of transmission lines utilizing a mixture of 69-, 115-, 138-, 161-, 230-, and 500-kv facilities. In the Big Black River Basin, Mississippi Power and Light Company operates a strong grid of 115-kv facilities as shown on the attached transmission map, plate 2. In the northeast portion of the basin, TVA operates a 46-kv transmission system. There is now developing throughout Study Area K a new system of 345- and 500-kv transmission facilities resulting from some of the new pools discussed above, principally SCEC and Mo-Kan. Mississippi Power and Light Company is constructing in the basin a 500-kv transmission line from Vicksburg northeast to interconnect with TVA near Kosciusko. The existing lower voltage facilities in the basin are being strengthened to facilitate seasonal diversity exchanges.

The installed and dependable capacity of electric utility generating plants in service on Coordination Study Area K as of December 31, 1965, is shown in the following table:

Table 3

Coordination Study Area K

Installed and Dependable Capacity of Utility Generating Plants

December 31, 1965

(kilowatts)

| <u>Power Supply Area</u> | <u>Gas Turbine</u> | <u>Hydro</u> | <u>Steam</u> | <u>Internal Combustion</u> | <u>Total</u> |
|----------------------------|--------------------|----------------|--------------|----------------------------|--------------|
| <u>Installed Capacity</u> | | | | | |
| 25 | 73,700 | 852,340 | 4,313,671 | 223,335 | 5,463,046 |
| 29 | 1,250 | 2,910 | 1,274,674 | 257,394 | 1,536,228 |
| 33 | 106,700 | 415,500 | 3,440,819 | 139,453 | 4,102,472 |
| 34 | 23,750 | 223,600 | 1,329,872 | 96,105 | 1,673,327 |
| 35 | 0 | 0 | 2,839,030 | 105,376 | 2,944,406 |
| Area K | 205,400 | 1,494,350 1/2/ | 13,198,066 | 821,663 | 15,719,479 |
| <u>Dependable Capacity</u> | | | | | |
| 25 | 71,950 | 845,000 | 4,295,104 | 208,542 | 5,420,596 |
| 29 | 1,250 | 1,500 | 1,369,662 | 246,937 | 1,619,349 |
| 33 | 102,450 | 397,100 | 3,543,800 | 126,587 | 4,169,937 |
| 34 | 25,750 | 204,900 | 1,376,880 | 91,061 | 1,698,591 |
| 35 | 0 | 0 | 2,728,894 | 93,574 | 2,822,468 |
| Area K | 201,400 | 1,448,500 1/2/ | 13,314,340 | 766,701 | 15,730,941 |

1/ Total capacity includes small hydroelectric plants: i.e., Osceola, Lowell, Niangua, Dams 1 and 3, Bowersock Mills & Power Co., Rocky Ford, Marysville, and Lake Eucha. (Totals are 11,550 kw installed capacity and 6,500 kw dependable capacity) which are not included in the total dependable capacity used in future monthly load curve analyses because of their small size and are not included in Tables 4, 5, and 6.

2/ Taum Sauk pumped storage capacity of 350,000 kw is marketed outside Study Area K and is excluded from this table.

Of the above total, 84.6 percent of the dependable capacity is steam-electric, 9.2 percent is hydroelectric, 4.9 percent is internal combustion, and 1.3 percent is gas turbine driven capacity. The largest generating units in service as of December 31, 1965 (manufacturer's maximum nameplate rating), were Louisiana Power and Light Company's Little Gypsy No. 2 rated at 420,750 kw and Arkansas Power and Light Company's Robert E. Ritchie No. 1 with a rating of 359,040 kw. As a result of the developing EHV grid and growing loads, larger units are under construction and scheduled as discussed later. The Baxter Wilson Plant of the Mississippi Power and Light Company, with installed capacity of 500,000 kw, will be the largest steam-electric generating unit located in the Big Black River Basin. The City of Kosciusko, as well as an industrial system, operate smaller generating stations near the basin boundary.

Gas is the principal fuel for steam-electric generation in Study Area K although the use of coal is increasing in Missouri, eastern Kansas, and northeastern Arkansas. There are at the present time no commercial nuclear plants in Study Area K (or the basin) but one of the major utilities has indicated that a nuclear unit as large as 750 mw may be installed as early as 1973, pending results obtained with an experimental nuclear plant under construction near Fayetteville, Arkansas. Large conventional outdoor gas-fired steam-electric generating units comprise the principal current and future power supply and thus provide the logical alternative for evaluation of hydroelectric facilities in the basin.

b. Industrial Plants

Throughout Coordination Study Area K, a large number of industries own and operate their own generating plants. The installed capacity for industry-owned generation in the area as of December 31, 1965 amounted to 1,796 mw of steam-electric capacity, and 268 mw of diesel-electric capacity for a total of 2,064 mw. Total generation during 1965 was 13,995 million kwh.

By far the largest of the industry-owned generating plants is the Kaiser Aluminum Company primary aluminum reduction plant at Chalmette in Saint Bernard Parish, Louisiana, which had a 1965 installed capacity of 398,000 kw steam and 103,200 kw diesel, and a 1965 generation of 4,094 million kwh. The alumina plants of Alcoa at Bauxite, Arkansas, and of Kaiser at Gramercy and Baton Rouge, Louisiana, had a total installed capacity of 77,750 kw, and a 1965 generation of 537.7 million kwh.

A number of large pulp and paper industrial generating plants are located in the forested portions of the study area. International Paper Company's Pine Bluff plant in Arkansas is the largest with an installed capacity of 97,880 kw and a 1965 generation of 565.9 million kwh. International Paper has other large generating stations at plants located near Camden, Arkansas, Springhill and Bastrop, Louisiana, and Natchez, Mississippi; Gaylord Container Corporation, Olin Mathieson Chemical

Corporation, and Georgia Pacific Corporation have generating plants near Bogalusa and Monroe, Louisiana and Crossett, Arkansas.

A number of large refinery and chemical generating plants are located in the area, particularly along the Gulf Coast and lower reaches of the Mississippi River. The Dow Chemical Company's Plaquemine, Louisiana plant has installed generating capacity of 110,000 kw and generated 1019.8 million kwh during 1965. The Pittsburgh Plate Glass Company has two plants in the Lake Charles, Louisiana area with installed generating capacity of 90,000 kw and 83,680 kw with 1965 generation of 636.0 million kwh and 236.0 million kwh, respectively. The Texas Company and Socony Mobil Oil Company have large refineries at Port Arthur and Beaumont, Texas, respectively, including generating facilities. Other chemical and refining facilities with generation are concentrated in the Beaumont-Port Arthur-Lake Charles and Baton Rouge areas.

Other industrial plants engaged in the manufacturing, processing, or production of sulphur, sugar, lumber, other forest products, salt, cement, and lime, have their own generation at many locations due principally to the advantages of utilizing steam in processing.

Industry-owned generation is not a part of the public power supply but is given consideration in projecting future electric utility load levels.

c. Interarea Transfers

By far the largest interarea transfer to be considered between Study Area K, the designated market for Big Black River Basin hydroelectric power and adjoining areas, is the seasonal diversity exchange scheduled between the South Central Electric Companies (SCEC) and the Tennessee Valley Authority (TVA). The 11 companies organized as SCEC operate as a part of the Southwest Power Pool and operate in the States of Arkansas, Oklahoma, Louisiana, Mississippi, Missouri, Kansas, and Texas. These utilities all have a decided summer peak, principally resulting from seasonal air conditioning loads. TVA, on the other hand, has a high winter peak load attributable principally to electric heating. By the winter of 1968-1969, the exchange of seasonal diversity will provide the delivery of 1,500 mw of seasonal diversity capacity to TVA from the SCEC companies in winter and the reverse in summer. Two 500-kv lines from the TVA area connecting to an extensive SCEC grid of 500- and 345-kv lines provide the necessary EHV transmission to deliver the scheduled interchange. An interarea transfer of 1,500 mw between Study Area K and Study Area F (TVA) is therefore utilized in the 1970 power requirements and supply analyses. Studies are now in progress toward an expansion of this exchange to 2,500 mw during the early years of the 1970 decade. Indications are that this more extensive exchange will be feasible and the power requirements analyses for 1980 therefore reflect a 2,500 mw interarea transfer between Study Areas K and F.

A 161-kv interconnecting tie line passing through Maryville in northwest Missouri has been placed in service between Southwestern Power Administration operating in the Arkansas-White-Red River Basins and the Bureau of Reclamation Eastern Division, Missouri River Basin Area. This intertie provides savings in reserve; increased utilization of generating facilities; greater flexibility in meeting variations in loads; hourly, daily, and a small amount of seasonal diversity - the latter being available as the Missouri River Basin normally peaks in winter and the Southwestern Power Administration peaks in summer. Within the limitations of the transmission capacity and generating capability, excess hydroelectric energy available during flood periods and at times of other required releases such as for navigation, excess energy may be transferred between basins having the effect of storing water for later production of usable energy. Similarly, hydraulic benefit may be obtained when adverse hydro conditions occur in either area. With this interconnection, the Southwestern Power Administration system and also the Missouri River Basin system is now considered as having an additional 25 mw of power available for customer service.

In addition to the above seasonal diversity power exchanges, there are a number of contractual firm power commitments affecting utilities operating along the boundary of Study Area K, particularly that portion bordering on Study Area I. These contracts are generally offsetting, subject to rather frequent revision, and are therefore not included in our long-term analyses of power supply and requirements.

d. Retirements

The retirement of generating units involves many operating variables and may be greatly influenced by one principal factor such as space in the plant building. Actual operating experience gives an indication of what to expect. Older machines are usually used for peaking and standby service after having been displaced from base load service by more efficient and larger units. Equipment retired in some cases is not immediately dismantled since the cost of removal may exceed its salvage value. In other cases, sites for station locations have become difficult to find and sometimes unavailable at any reasonable price. Under these circumstances, older units are removed to provide space for newer, more efficient and larger units. Many retirements in the past have been on the basis of aging, physical condition and high operating cost. In the future, it is possible that unit size and obsolescence will be deciding factors as small units become less important with system capacity doubling approximately every ten years. Power pooling by EHV interconnections will tend to promote earlier retirements of units. In general, the retirement age of generating units is assumed to be 35 years in the development of capacity available. Retirements subsequent to 1980 will involve the modern type of high-pressure high-temperature equipment with critical metallurgy and complicated cycle arrangements. This type of equipment may be subject to lower life expectancy - possibly 30 years.

e. Scheduled Additions

Extensive and adequate advance planning is essential in order to meet in the most economical manner the rapidly growing future requirement for electric power. Increasing plant size has been a natural step to reap the advantages of economies of scale in capital cost, operation and maintenance. The combination of increasing power demands, decreasing number of excellent sites, and EHV interconnections result in a trend for developing larger units. These larger units have contributed to the increase in temperature and pressure of throttle steam into the supercritical range.

Shown on the table below are known units (300 mw or larger) which are being planned in Study Area K:

Major Scheduled Additions to
Fuel Electric Generating Capacity in Study Area K

| <u>PSA</u> | <u>Utility</u> | <u>Plant</u> | <u>Installed Capacity (kw)</u> | <u>Date in Service</u> |
|------------|------------------------------|---------------------|--|----------------------------|
| 25 | Mississippi Pwr. & Lt. Co. | Baxter Wilson #1 | 500,000* | 12/66 |
| 25 | New Orleans Pub.Svc.Co.,Inc. | Michoud #3 | 500,000* | 4/67 |
| 25 | Arkansas Power & Light Co. | Robt. E. Ritchie #2 | 500,000* | 1/68 |
| 25 | Louisiana Power & Light Co. | Little Gypsy #3 | 500,000* | 12/68 |
| 25 | Arkansas Power & Light Co. | Lake Catherine #4 | 500,000 | 12/69 |
| 25 | Louisiana Power & Light Co. | Ninemile Pt. #4 | 550,000* | 12/70 |
| 33 | Public Ser. Co. of Okla. | Southwestern #3 | 310,000 | 5/67 |
| 33 | Oklahoma Gas & Elec. Co. | Horseshoe Lake #8 | 415,000 | 5/69 |
| 33 | Southwestern Public Ser. Co. | Wilkes #2 | 345,000 | 1970 |
| 33 | Public Ser. Co. of Okla. | Northeastern #2 | 450,000* | 1970 |
| 34 | Kansas Gas & Electric Co. | Gordon Evans #2 | 368,000 | 4/67 |
| 34 | Missouri Public Service Co. | Sibley #3 | 340,000* | 3/69 |
| 35 | Gulf States Utilities Co. | Sabine #3 | 410,000 | 11/66 |
| 35 | Gulf States Utilities Co. | Willow Glen #3 | 530,000* | 11/68 |
| 35 | Gulf States Utilities Co. | Nelson #4 | 530,000* | 11/69 |

*Super critical steam conditions

A study of the possible critical period operation of hydroelectric plants on the estimated load shape in Study Area K for the year 1970 indicates that hydroelectric capacity appears to saturate the peak portion of the load; however, as the load grows, it will be possible to provide additional peaking capacity to meet this growing segment of the load.

9. EXISTING HYDROELECTRIC RESOURCES

a. Projects in the Big Black River Basin

There are twenty-nine existing hydroelectric projects in Study Area K with an installed capacity of 3,237.4 mw including those projects under construction and those definitely scheduled. None of these are in the Big Black River Basin. There are no definitely scheduled hydroelectric projects in the Big Black River Basin at this time.

b. Projects in Other Basins in Study Area K

The 29 hydroelectric projects within Study Area K are listed with some of their pertinent data in Tables 4, 5, and 6. Table 7 is a schedule of availability of dependable capacity between 1965 and 1980.

Table 4

Existing Hydroelectric Projects in White River Basin
December 31, 1965

| <u>Plant</u> | <u>Installed Capacity (mw)</u> | <u>Dependable Capacity (mw)</u> | <u>Average Annual Energy (million kwh)</u> |
|--------------|--|---|--|
| Beaver | 112.0 | 112.0 | 172.0 |
| Table Rock | 200.0 | 200.0 | 495.0 |
| Ozark Beach | 16.0 | - 1/ | 94.4 |
| Bull Shoals | 340.0 | 340.0 | 785.0 |
| Norfork | 70.0 | 70.0 | 196.0 |
| Taum Sauk 2/ | 350.0 | - 2/ | - 2/ |
| Greers Ferry | 96.0 | 96.0 | 189.0 |
| Totals | 1,184.0 | 818.0 | 1,931.4 |

1/ Dependable capacity limited by high tailwater during, and following, flood periods.

2/ Project is physically located within Area K, but generation is marketed on system of Union Electric Company outside of Area K.

Table 5

Existing Hydroelectric Projects in Red River Basin
December 31, 1965 ^{1/}

| <u>Plant</u> | <u>Installed Capacity - (mw)</u> | | | <u>Dependable Capacity</u> (mw) | <u>Average Annual Energy</u> (million kwh) |
|---------------------------|----------------------------------|---------------------------|-----------------------------|------------------------------------|---|
| | <u>Existing</u> | <u>Under Construction</u> | <u>Definitely Scheduled</u> | | |
| Denison ^{2/} | 35.0 ^{4/} | | 35.0 ^{4/} | 27.0 ^{4/} | 123.5 ^{4/} |
| Broken Bow ^{2/} | | 100.0 | 100.0 | 86.0 | 129.0 |
| Blakely Mt. ^{3/} | 75.0 | | 75.0 | 65.0 | 155.9 |
| Carpenter ^{3/} | 56.0 | | 56.0 | 59.0 | 103.3 |
| Rommel ^{3/} | 9.3 | | 9.3 | 10.0 | 49.0 |
| De Gray ^{3/} | | 68.0 | 68.0 | 62.0 | 91.1 |
| Narrows ^{3/} | <u>17.0</u> | <u>8.5</u> | <u>25.5</u> | <u>21.0</u> | <u>29.1</u> |
| Totals | 192.3 | 176.5 | 368.8 | 330.0 | 680.9 |

^{1/} Includes projects under construction.

^{2/} Located in Lower Red River Basin.

^{3/} Located in Ouachita River Basin portion of Red River Basin.

^{4/} One-half of totals are tabulated since one-half of output is considered to be available for Texas (Study Area J).

Table 6

Existing Hydroelectric Projects Within Study Area K
Other Than in Big Black, White, or Red River Basins
December 31, 1965 1/

| Plant | Installed Capacity-- (mw) | | | | Dependable Capacity (mw) | Average Annual Energy (million kwh) |
|-----------------------------|---------------------------|--------------------|----------------------|---------|-----------------------------|--|
| | Existing | Under Construction | Definitely Scheduled | Total | | |
| <u>Arkansas River Basin</u> | | | | | | |
| Keystone | | 70.0 | | 70.0 | 70.0 | 228.0 |
| Pensacola | 86.4 | | | 86.4 | 85.0 | 330.0 |
| Salina | | 130.0 | 390.0 | 520.0 | 520.0 2/ | 520.0 3/ |
| Markham Ferry | 108.0 | | | 108.0 | 110.0 | 190.0 |
| Fort Gibson | 45.0 | | | 45.0 | 45.0 | 190.5 |
| Webbers Falls | | 60.0 | | 60.0 | 66.0 | 213.3 |
| Tenkiller | | | | | | |
| Ferry | 34.0 | | | 34.0 | 28.0 | 114.5 |
| Eufaula | 90.0 | | | 90.0 | 88.0 | 317.0 |
| Robert S. | | | | | | |
| Kerr | | 110.0 | | 110.0 | 110.0 | 459.0 |
| Ozark | | 100.0 | | 100.0 | 100.0 | 429.0 |
| Dardanelle | 93.0 | 31.0 | | 124.0 | 124.0 | 613.0 |
| Totals | 456.4 | 501.0 | 390.0 | 1,347.4 | 1,346.0 | 3,604.3 |
| <u>Sabine River Basin</u> | | | | | | |
| Toledo Bend | | 80.0 | | 80.0 | 80.0 | 205.2 |
| <u>Neches River Basin</u> | | | | | | |
| Sam Rayburn | 52.0 | | | 52.0 | 49.0 | 116.8 |
| <u>Missouri River Basin</u> | | | | | | |
| Stockton | | 45.2 | | 45.2 | 44.0 | 55.0 |
| Kaysinger | | | | | | |
| Bluff | | 160.0 | | 160.0 | 160.0 | 265.0 4/ |
| Totals | | 205.2 | | 204.0 | 204.0 | 320.0 |

1/ Includes projects under construction and definitely scheduled.

2/ This installation will be accomplished in four stages, 130-mw each; 130-mw definitely scheduled for 1958 and the three remaining stages planned for 1971, 1974, and 1977.

3/ Based on 1,000 hr./yr. operation. Pumping and generating cycle efficiency will be 76.2 percent.

4/ Project will require pumping energy of 173.5 million kwh annually.

Table 7

Dependable Hydroelectric Capacity, Existing,
Under Construction, and Scheduled in Study Area K

| <u>Plant</u> | <u>Dependable Capacity (1,000 kw)</u> | | | <u>Total 1980</u> |
|-----------------------------|---------------------------------------|--------------------------------|--------------------------------|-----------------------|
| | <u>Existing 12-31-65</u> | <u>Scheduled 1966-1970</u> | <u>Scheduled 1971-1980</u> | |
| <u>Red River Basin</u> | | | | |
| Denison | 27.0 ^{1/} | - | - | 27.0 ^{1/} |
| Broken Bow | - | 86.0 | - | 86.0 |
| Blakely Mountain | 65.0 | - | - | 65.0 |
| Carpenter | 59.0 | - | - | 59.0 |
| Rommel | 10.0 | - | - | 10.0 |
| De Gray | - | - | 62.0 | 62.0 |
| Narrows | 14.0 | 7.0 | - | 21.0 |
| <u>White River Basin</u> | | | | |
| Beaver | 112.0 | - | - | 112.0 |
| Table Rock | 200.0 | - | - | 200.0 |
| Bull Shoals | 340.0 | - | - | 340.0 |
| Norfolk | 70.0 | - | - | 70.0 |
| Greens Ferry | 96.0 | - | - | 96.0 |
| <u>Arkansas River Basin</u> | | | | |
| Keystone | - | 70.0 | - | 70.0 |
| Pensacola | 85.0 | - | - | 85.0 |
| Salina | - | 130.0 | 390.0 | 520.0 |
| Markham Ferry | 110.0 | - | - | 110.0 |
| Fort Gibson | 45.0 | - | - | 45.0 |
| Webbers Falls | - | - | 66.0 | 66.0 |
| Tenkiller Ferry | 28.0 | - | - | 28.0 |
| Eufaula | 88.0 | - | - | 88.0 |
| Robert S. Kerr | - | 55.0 | 55.0 | 110.0 |
| Ozark | - | - | 100.0 | 100.0 |
| Dardanelle | 93.0 | 31.0 | - | 124.0 |
| <u>Missouri River Basin</u> | | | | |
| Stockton | - | - | 44.0 | 44.0 |
| Kaysinger Bluff | - | - | 160.0 | 160.0 |
| <u>Neches-Sabine Basin</u> | | | | |
| Sam Rayburn | - | 49.0 | - | 49.0 |
| Toledo Bend | - | 80.0 | - | 80.0 |
| <u>Total</u> | <u>1,442.0</u> | <u>508.0</u> | <u>877.0</u> | <u>2,807.0</u> |

^{1/} One-half of capacity is tabulated since one-half of output is considered to be available for Texas (Study Area J).

c. Summary of Projects in Study Area K

The total dependable capacity of existing, under construction, and definitely scheduled hydroelectric projects in Study Area K is 2,807,000 kw and the total average energy is 6,858.6 million kwh. The analyses of future monthly load curves in this report do not include the Salina and Webbers Falls projects.

With the above noted exceptions, the load curves reflect the dependable capacity of existing and under-construction projects to be marketed in Area K.

10. NEED FOR ADDITIONAL CAPACITY

The following Table 8 shows power requirements, power supply, and additional capacity needed in Study Area K for 1965, 1970, and 1980.

Table 8

Additional Dependable Capacity to
Supply Estimated Electric Utility Loads in Study Area K
(thousand kilowatts)

| | <u>1965</u> | <u>1970</u> | <u>1980</u> |
|-------------------------------------|---------------------|---------------------|---------------------|
| <u>Capacity Requirements</u> | | | |
| Peak Demand | 13,070 | 19,300 | 35,900 |
| Reserve Requirement (12%) | 1,568 | 2,316 | 4,310 |
| Total Capacity Required | 14,638 | 21,616 | 40,210 |
| <u>Capacity Available</u> | | | |
| Existing Fuel-Electric 12-31-65 | 14,282 | 14,282 | 14,282 |
| Less Estimated Retirements | 0 | 934 | 1,460 |
| Net | 14,282 | 13,348 | 12,822 |
| Existing Hydroelectric 12-31-65 | 1,442 ^{1/} | 1,442 ^{1/} | 1,442 ^{1/} |
| Scheduled Additions to Fuel-Elec. | - | 9,273 | 9,273 |
| Scheduled Additions to Hydro | - | 508 ^{1/} | 1,385 ^{1/} |
| Imports of Firm Power | 448 | 1,525 ^{2/} | 2,525 ^{3/} |
| Total Capacity Available | 16,172 | 26,096 | 27,447 |
| <u>Additional Capacity Required</u> | <u>(1,534)</u> | <u>(4,480)</u> | <u>12,763</u> |

^{1/} See Table 7.

^{2/} SCEC-TVA Seasonal Capacity Agreement. Hydroelectric capacity diversity from NPS Study Areas I and L estimated to be 25 mw.

^{3/} SCEC-TVA capacity diversity estimated to increase to 2,500 mw by 1980. Hydroelectric capacity diversity from NPS Study Areas I and L estimated to be 25 mw.

The preceding table, which allows a reserve requirement of 12 percent, shows a surplus of capacity of 1,534 mw in 1965 and 4,480 mw in 1970 and a deficiency of 12,763 mw in 1980. A major part of this deficiency in 1980 will be met by future steam-electric generating capacity. The tabulation demonstrates the large and growing need for additional generating capacity in the future, some of which may be met by conventional and pumped-storage hydroelectric capacity. The Federal Power Commission's National Power Survey of 1964 was not extended beyond 1980 and adequate details are not available for extending the above table beyond that date for this report.

11. PORTION OF FUTURE LOAD WHICH COULD BE SUPPLIED BY
POTENTIAL HYDROELECTRIC PROJECTS

a. Use of Hydroelectric Projects in Supplying Future Load

(1) Advantages

Hydroelectric plants have several important advantages over thermal plants. They neither consume water, nor do they heat the waters of rivers and streams as thermal plants do with the possibility of causing thermal pollution; and they do not contribute to air pollution. The maintenance costs of hydroelectric plants are relatively low, and in many cases the plants can be designed for automatic or remote control operation. The ability to start quickly and change power output rapidly makes hydroelectric plants particularly suitable for carrying peak loads.

When hydro peaking capacity is added to meet load growth, system energy costs are greater, as a rule, than they would be if base-load thermal units were added instead. However, this differential becomes negligible over the life of the project due to the displacement of the alternate thermal plant from a base-load position when the thermal plant is new to a peaking position during the later years of its useful life.

(2) Multiple Purpose Projects

Sites for the economical development of single purpose hydro plants in Study Area K are virtually non-existent. There are a number of factors which contribute to this situation. Technological advancement is producing a continuing decrease in unit cost of steam-electric developments, the competing alternative source of electric power. Thus, hydroelectric development is being subjected to increasingly heavy challenge in regard to economics. Another deterrent is the awareness in recent years of the shortage of water in long range plans for resource development. This has resulted in a low priority for hydroelectric power in the planned use of water storage. Therefore, the future development of most hydroelectric power is dependent on the addition of this function to a project which might be constructed for other primary purposes.

In many cases the development of hydroelectric power provides such other associated benefits as recreation, fish and wildlife enhancement, flood control, and cooling water for thermal-electric plants and industrial plants. Many multiple purpose projects would not be economically justified without the inclusion of power as one of the project purposes. The favorable characteristics of hydroelectric power and the frequent multiple use benefits associated with its development provide strong incentives for utilizing the remaining potential of our water power resources wherever they can be developed on an economical basis. Peak loads usually occur in months coincident with peak water supply needs in this area and where water supply withdrawals are made downstream from the powerhouse make the inclusion of hydroelectric power more adaptable to projects in which water supply is of paramount importance.

(3) Peaking Operations

Peaking capacity is generally understood to mean that part of a system's generating equipment which is operated intermittently for short periods during the hours of highest daily, weekly, or seasonal demand. Variations in power demands are caused by many factors, but usually the maximum loads result from weather extremes superimposed on the more normal peaks associated with the living habits and work schedules of the population served and characteristics of the industries included in the load.

Hydroelectric developments in Study Area K are designed to operate largely during the hours of peak power loads. The annual cost of providing peaking capacity by installing additional units in hydroelectric plants is less, in most cases, than the cost of additional capacity at alternative sources. Also the ability to start quickly and change power output rapidly makes hydroelectric plants particularly suitable for carrying peak loads and for assistance in the supply of spinning reserve. Hydroelectric plants having seasonal or annual storage frequently have their operations scheduled to serve loads during only the months of highest peak demands on the system. Plants having only sufficient storage for daily operations are used daily during the hours of peak load.

The growing need for peaking capacity is resulting in planning for lower plant factor operations. However, the effects of such operations, with the accompanying high discharges of water for short periods of time, must be carefully studied to be certain that they are consistent with the over-all basin development. Hydroelectric plants in Study Area K have been planned and constructed to operate at annual plant factors as low as five percent to meet particular system needs. Operated primarily for peaking power at low plant factor, project sites previously considered infeasible of development may be found to be economical as the need for additional peaking capacity develops.

b. Potential Hydroelectric Resources

From past studies made at various times under varying conditions of cost, a backlog of potential sites for hydroelectric power development in Study Area K has been catalogued. The total, for conventional and pumped-storage installations, is 13,409,300 kw, of which 28,000 kw are in the Big Black River Basin as listed in Table 9. Other potentials in other basins within Study Area K are shown in Tables 10, 11, and 12. These potentials include future additional capacity at existing plants, authorized inactive projects, and sites that have been screened and found to warrant further consideration under appropriate conditions of economics and site development for other purposes. It is emphasized that this list of potential projects is not to be considered as firm since much additional study would be required based on modern day procedures, conditions, and costs to develop a reasonably accurate listing.

Table 9

Hydroelectric Potentials in Big Black River Basin

| <u>Project</u> | <u>State</u> | <u>PSA</u> | <u>Installed Capacity (mw)</u> | <u>Remarks</u> |
|----------------|--------------|------------|--|-----------------------------------|
| Youngton | Miss. | 25 | 28.0 | Formerly known as Edwards site |

It is to be recognized that further study as to the usability of potential Big Black River Basin hydro on the Study Area K load will be necessary since there are other potentials located within Study Area K outside the basin boundaries. Also, the marketing agency for power generated at federally constructed projects must give preference in marketing such power to certain customers. Accordingly, each hydroelectric installation definitely proposed by a Federal construction agency must be individually examined as to both economic and financial feasibility prior to authorization and also prior to construction to determine whether or not suitable marketing arrangements under the preference clause can be negotiated.

Table 10

Hydroelectric Potentials in White River Basin

| <u>Project</u> | <u>State</u> | <u>PSA</u> | <u>Installed Capacity (mw)</u> | |
|----------------|--------------|------------|--|---|
| Grandview | Ark. | 25 | 18.0 | |
| Galena | Mo. | 34 | 43.0 | |
| Ozark Beach | Mo. | 34 | 24.0 | Additional capacity at licensed project. |
| Cotter | Ark. | 25 | 33.0 | |
| Buffalo City | Ark. | 25 | 30.0 | |
| Compton | Ark. | 25 | 1,000.0 1/ | Pumped storage. On proposed National Scenic Riverway. |
| Point Peter | Ark. | 25 | 700.0 1/ | Pumped storage. On proposed National Scenic Riverway. |
| Gilbert | Ark. | 25 | 87.0 | Includes 31.0-mw reversible unit. On proposed National Scenic Riverway. |
| Lone Rock | Ark. | 25 | 90.0 | Authorized for flood control. On proposed National Scenic Riverway. |
| Norfork | Ark. | 25 | 70.0 | Additional capacity at existing project. |
| Optimus | Ark. | 25 | 500.0 1/ | Pumped storage. |
| Marcella | Ark. | 25 | 1,000.0 1/ | Pumped storage. |
| Wolf Bayou | Ark. | 25 | 180.0 | |
| Clearwater | Mo. | 34 | 28.0 | Existing project for flood control and water supply. |
| Blair Creek | Mo. | 34 | 120.0 | On National Scenic Riverway. |
| Doniphan | Mo. | 34 | 60.0 | On National Scenic Riverway. |
| Water Valley | Ark. | 25 | 25.0 | Authorized without power. On proposed National Scenic Riverway. |
| Wildhorse | Ark. | 25 | 13.0 | |
| Hardy | Ark. | 25 | 52.0 | |
| Bell Foley | Ark. | 25 | 24.0 | Authorized without power. |
| Millers Point | Ark. | 25 | 600.0 1/ | Pumped storage. |
| Judsonia | Ark. | 25 | 18.0 | |
| Total | | | 4,715.0 | |

1/ Based on preliminary studies and field reconnaissance.

Table 11

Hydroelectric Potentials in Red River Basin

| <u>Project</u> | <u>State</u> | <u>PSA</u> | <u>Installed Capacity</u> (mw) | |
|-----------------|--------------|------------|-----------------------------------|---|
| Gainesville | Tex.-Okla. | 33 | 50.0 ^{1/} | |
| Dougherty | Okla. | 33 | 25.0 | |
| Durwood | Okla. | 33 | 20.0 | |
| Denison | Tex.-Okla. | 33 | 52.5 ^{1/} | Additional capacity at existing project. |
| Durant | Okla. | 33 | 8.4 | |
| Boswell | Okla. | 33 | 7.6 | Authorized without power. |
| Tuskahoma | Okla. | 33 | 1,500.0 ^{2/} | Pumped storage. |
| Choctaw | Okla. | 33 | - | Pumped storage. |
| Jack Fork | Okla. | 33 | 1,300.0 ^{2/} | Pumped storage. |
| Clayton | Okla. | 33 | 1,000.0 ^{2/} | Pumped storage. |
| Upper Antlers | Okla. | 33 | 100.0 | |
| Hugo | Okla. | 33 | 850.0 | Authorized without power. Potential pumped storage. |
| Lukfata | Okla. | 33 | 30.0 | Authorized without power. |
| Sherwood | Okla. | 33 | 1,103.0 | Includes 1,000-mw pumped storage. |
| Broken Bow | Okla. | 33 | 700.0 | Pumped storage. Additions to under construction conventional power plant. |
| Gillham | Ark. | 33 | 380.0 | Pumped storage. Addition to under construction storage project. |
| Dierks | Ark. | 33 | 13.5 | Authorized without power. |
| Fiddler's Creek | Ark. | 25 | 20.0 | |
| Carpenter | Ark. | 25 | 28.0 | Additional capacity at licensed project. |
| Rommel | Ark. | 25 | 6.6 | Additional capacity at licensed project. |
| Rockport | Ark. | 25 | 8.0 | |
| Caddo Gap | Ark. | 25 | 2.3 | |
| De Gray | Ark. | 25 | 40.0 | Additional capacity at existing project. |
| Riggs Bluff | Ark. | 25 | 6.0 | |
| Kirkland | Ark. | 25 | 4.0 | |
| Benton | Ark. | 25 | 25.0 | |
| Total | | | 7,279.9 | |

^{1/} One-half of potential capacity is tabulated since one-half of output is considered to be available for Texas (study area J).

^{2/} Based on preliminary studies and field reconnaissance.

Table 12

Hydroelectric Potentials in Study Area K
Other Than Big Black, White or Red River Basins

| <u>Project</u> | <u>State</u> | <u>PSA</u> | <u>Installed Capacity (mw)</u> | <u>Remarks</u> |
|--------------------------------|--------------|------------|--|---|
| <u>Arkansas River Basin</u> | | | | |
| Kaw | Okla. | 33 | 25.0 | Project authorized without power. |
| Oologah | Okla. | 33 | 12.0 | Project constructed with power deferred. |
| Chewey | Okla. | 33 | 42.0 | |
| White Oak | Ark. | 33 | 500.0 | Pumped storage. |
| Nimrod | Ark. | 25 | 14.0 | Existing project for flood control and water supply. |
| Petit Jean | Ark. | 25 | <u>500.0</u> | Pumped storage. |
| Total | | | 1,093.0 | |
| <u>St. Francis River Basin</u> | | | | |
| Rowland Church | Mo. | 25 | 35.0 | |
| Wappapello | Mo. | 25 | 7.5 | Existing flood control and water supply project. |
| Total | | | 42.5 | |
| <u>Yazoo River Basin</u> | | | | |
| Arkabutla | Miss. | 25 | 12.0 | Existing flood control and water supply project. |
| Sardis | Miss. | 25 | 15.0 | Existing flood control and water supply project. |
| Grenada | Miss. | 25 | 5.0 | Existing flood control and water supply project. |
| Total | | | 32.0 | |
| <u>Missouri River Basin</u> | | | | |
| Pomme de Terre | Mo. | 34 | 16.8 | Existing flood control and water supply project. |
| Richland | Mo. | 34 | 25.0 | |
| Arlington | Mo. | 34 | <u>30.0</u> | |
| Total | | | 71.8 | |

(Continued)

Table 12 (continued)

| <u>Project</u> | <u>State</u> | <u>PSA</u> | <u>Installed Capacity (mw)</u> | <u>Remarks</u> |
|---------------------------|--------------|------------|--|---|
| <u>Kansas River Basin</u> | | | | |
| Milford | Kan. | 29 | 13.0 | |
| Tuttle Creek | Kan. | 29 | 20.0 | |
| Topeka | Kan. | 29 | 20.0 | |
| Tecumseh | Kan. | 29 | 15.0 | |
| Lecomptan | Kan. | 29 | 15.0 | |
| Audora | Kan. | 29 | <u>25.0</u> | |
| Total | | | 108.0 | |
| <u>Neches River Basin</u> | | | | |
| Rockland | Tex. | 35 | 13.5 | Authorized - inactive. |
| Dam "A" | Tex. | 35 | 2.7 | Authorized - inactive. |
| Dam "B" | Tex. | 35 | 2.9 | Existing flood control and water supply project. |
| Total | | | <u>19.1</u> | |
| <u>Sabine River Basin</u> | | | | |
| Bon Wier | Tex. | 35 | <u>20.0</u> | |
| Total other basins | | | 1,386.4 | |

c. Estimated Load Shapes for 1980, 2000, and 2020

Figures 2, 3, and 4 show - for the peak month of August - the possible critical period operation of hydroelectric plants on the estimated load shapes in Study Area K for the years 1980, 2000, and 2020. These load shapes are projected from the National Power Survey estimates to 1980. The estimated load shape for the peak week in 1980 is shown on Figure 6.

d. Hydroelectric Capacity Utilization

(1) Conventional Hydroelectric Plants

Hydroelectric generating capacity, either existing or under construction, as shown in Table 7, is represented on Figures 2, 3, and 4 as solid areas, except as noted elsewhere. The dotted areas on these curves represent the maximum amount of hydroelectric capacity that could be utilized at 20-percent plant factor during August. Also shown are curves

(Figure 5) indicating the maximum hydroelectric capacity utilization at various August plant factors ranging from 5 to 30 percent in Study Area K for the years 1980, 2000, and 2020. These curves are based on the load duration curves illustrated in Figures 2, 3, and 4. These estimates of the maximum amount of hydroelectric capacity which could be applied to future loads are conservative in that no hydroelectric capacity is shown in the peak 5 percent of the load. Even so, the amount which can be applied to the load is much larger than the potential capacity which has been listed in Tables 9, 10, 11, and 12.

(2) Pumped-Storage Hydroelectric Plants

There are a large number of possible sites for adjoining pumped-storage hydroelectric development but there are limitations on the amount of such capacity which could be applied to future loads. Figure 6 illustrates operation of pumped-storage hydroelectric capacity in the peak week of 1980 using a minimum of generation. This would be normal operation since, for economy, no more pumping would be done than necessary to supply loads and to keep the upper pond full for reserve. The energy generation indicated for the peak day is equivalent to six hours generation at maximum capacity. Some plants have been constructed at sites to provide only enough storage for six hours generation and nine hours pumping (assuming the commonly accepted ratio of 3 kwh pumping to 2 kwh generation). However, in areas of the Southwest affected by prolonged droughts and heat waves sufficient usable storage in the forebay should be available to provide operating flexibility, additional reserve, and application on lengthening daily peak loads. Therefore the expected normal requirements of 6-hour daily generation should be supplemented with an additional 2 hours of full load generation to develop an 8-hour generation day for a five-day week, thus providing a 2-hour daily reserve. These considerations would dictate the installation of 16 hours of forebay storage capacity in a weekly cycle of generation. The operation of the conventional hydroelectric plants in the peak week is not illustrated, but the August load duration curve for 1980 (Figure 2) shows all loads above 27,500 mw being carried by some combination of hydroelectric and fuel-electric capacity, and on this basis the weekly curve shows that some week-end hydroelectric generation would be required. If necessary to conserve water at conventional hydroelectric plants, some of this generation could be supplied by the pumped-storage plants and these plants could operate at 20-percent monthly plant factor, the same as assumed for the future potential conventional hydroelectric plants.

It is highly advantageous in the development of pumped-storage hydroelectric capacity that this capacity be physically located near a major load center and related in size to the electric load in that particular area. Concentrations of load are usually surrounded by the supporting steam-electric generation which represents a source of pumping energy for area pumped-storage facilities.

e. Summary of Future Loads Which Can be Supplied by
Hydroelectric Power Generation

A summary of the portion of the future load which could be supplied by potential hydroelectric projects at 20-percent August load factor is as follows:

| <u>Year</u> | <u>(millions of kilowatts)</u> | | | | |
|-------------|--------------------------------|----------------------|--------------------|--------------------------|-------------------------------------|
| | <u>Total Load</u> | <u>Fuel-Electric</u> | <u>Total Hydro</u> | <u>Existing Hydro 1/</u> | <u>Potential for Added Hydro 2/</u> |
| 1980 | 35.90 | 29.42 | 6.48 | 2.24 | 4.24 |
| 2000 | 93.00 | 76.52 | 16.48 | 2.24 | 14.24 |
| 2020 | 182.00 | 150.12 | 31.88 | 2.24 | 29.64 |

- 1/ Including capacity under construction or scheduled, except Salina (0.52 million kw) and Webbers Falls (0.066 million kw).
2/ Of these amounts the following could be in adjoining pumped-storage hydroelectric capacity:

| <u>Year</u> | <u>Millions of Kilowatts</u> |
|-------------|------------------------------|
| 1980 | 2.67 |
| 2000 | 6.92 |
| 2020 | 13.54 |

Summarizing, by 1980 the load shape is expected to be able to accommodate potential new hydroelectric capacity amounting to 4,240 mw of which 2,670 mw could be pumped-storage hydroelectric capacity as illustrated by the curve of the peak demand during the estimated peak week. This 2,670 mw includes a total of 1,520 mw for projects proposed or now under construction and leaves 1,150 mw of new pumped-storage capacity for development by 1980. Similarly, for the year 2000, the load would accommodate new hydroelectric capacity totaling 14,240 mw of which 6,920 mw (including the 1,520 mw proposed and now under construction) could be new pumped storage capacity. For the year 2020, corresponding figures would be 29,640 mw and 13,540 mw (including the 1,520 mw proposed and now under construction). The future need for conventional hydroelectric capacity is greater than the amount available from the total of all the potential sites.

SECTION III - PROJECT SCREENING

12. GENERAL

Consideration for hydroelectric power development took into account the head and flow available and possible restrictions on operation of the power plant. There are no sites in the basin suitable for development of a pumped-storage plant. This restricted the screening to a study of potential conventional hydroelectric development which, in this area, is limited to the inclusion of hydro power as an added purpose at a multiple purpose development.

13. INDIVIDUAL SITES SCREENED

a. Edwards

The Edwards site is on the main stem of the Big Black River about 75 miles above the mouth and is the approximate location of the Edwards site which has for a number of years been considered as a potential for power development. It was determined that this site has the physical attributes for a multiple purpose project for power, water supply, flood control, and recreation.

b. West

The West site is located on the main stem approximately 210 miles above the mouth. Development of a reservoir at this site would be very costly due to the wide valley at the dam site and the large amount of relocations necessary.

c. Durant

The Durant site is on the main stem about 200 miles above the mouth. Development of a reservoir at this site would encounter exorbitant costs due to highway, railroad, and urban relocations.

d. Conclusions

It was decided to study the feasibility of a storage project at the Edwards site. Although there is no demand for a significant amount of water supply storage at this time, it was proposed to investigate the site on the assumption that other water uses (besides power) could, in the future, make demands for a storage development at this site.

Excessive relocation costs prohibit further consideration of a storage project at the Durant or West site.

SECTION IV - PROJECT STUDIED FOR BASIN PLAN

14. GENERAL

Estimates have been made for a multipurpose project at the Edwards site featuring hydroelectric power, flood control and recreation. A power plant at the site would be a comparatively small generating unit which would be isolated with regard to other hydroelectric generation. Consideration was given to possible future withdrawals from storage for other purposes of water use. A pertinent data sheet, including economic data relative to the power feature, is included on the following page.

15. PERTINENT DATA

a. Physical Data

Daily discharge records of stream flow are available at the gage near Bovina for the period of 1936 to date. On a drainage area ratio basis the discharge at the Edwards site is 94 percent of that at the Bovina gage. From these flood records it was determined that the period of July 1962 to November 1963 is the critical period for the storage allocated to power at Edwards. Average flow was determined to be 3,000 cfs and average critical period flow is 1,200 cfs. Lake loss to evaporation was computed in accordance with U. S. Weather Bureau Technical Paper No. 37 and leakage was estimated to be 10 cfs.

Storage allocated to power consists of 710,000 acre-feet between elevation 177.0 feet and 160.0 feet. The operating tailwater is 117 feet which, with an estimated head loss of 2 feet, results in a net tailwater elevation of 119 feet. Prime power would be 4,000 kilowatts which, when based on a conservative 20 percent load factor, would produce 20,000 kilowatts dependable capacity. A proposed 28,000-kilowatt installation would, in conjunction with the stream flow of record, produce estimated average energy in the amount of 96 million kilowatt hours.

b. Economic Data

The estimated costs for the project were based on 3-1/4 percent interest rate, five-year construction period and 100-year amortization. The total investment allocated to power would be 26,404,000 and annual project costs would total \$1,029,000.

Power values applied to the output of this plant (\$15.50/kw capacity value and 2.4 mills/kwh energy value) are based on January 1, 1966 prices and were computed by the Fort Worth Regional Office of the Federal Power Commission. The annual benefits would total \$540,000 and the benefit-cost ratio for the power purpose would be 0.53.

It should be noted that costs and benefits shown on the Hydroelectric Project Screening Form differ from those in the Corps of Engineers Report, Volume III, Annex B, due to the use, in the Corps of Engineers Report, of Economic Development Benefits and the addition of "Engineering and Design" and "Supervision and Administration" costs to the total project costs.

Date: 7-66

RIVER BASIN PLANNING HYDROELECTRIC PROJECT SCREENING FORM

Project Name: Edwards Operating Agency: U.S.C.E. By: R.C.P.
 River Basin: Big Black Stream: Big Black River Status: Init. Study
 State: Mississippi Type of Dam: Earthfill River Mile: 75 ±
 Project Purposes: Power 1/ Data Source: U.S.C.E. DA Sq. Mi: 2,400

| RESERVOIR DATA | ELEVATION-Msl | AREA-ACRES | CAPACITY-ACRE FEET |
|------------------------|---------------|----------------|--------------------|
| Top of Dam | <u>201.0</u> | <u>---</u> | <u>---</u> |
| Max. Water Surface | <u>195.3</u> | <u>101,000</u> | <u>2,560,000</u> |
| Top Flood Pool | <u>191.0</u> | <u>88,000</u> | <u>2,120,000</u> |
| Top Power Pool | <u>177.0</u> | <u>56,000</u> | <u>1,120,000</u> |
| Top Conservation Pool | <u>160.0</u> | <u>29,000</u> | <u>410,000</u> |
| Bottom Power Pool | <u>160.0</u> | <u>29,000</u> | <u>410,000</u> |
| Upstream Power Storage | <u>---</u> | <u>---</u> | <u>---</u> |

HYDROELECTRIC PLANT DATA

Maximum Net Head: 53 Ft. Tailwater elevation for plant
 Avg. Net Head, Critical Period: 50 Ft. capability at minimum
 Minimum Net Head: 41 Ft. pool: 117.0 Ft. Msl.
 Number & Type Units: One (Kaplan) Size: 28,000 Kw
 Size: --- Kw
 Total Installed Capacity: 28,000 Kw
 Capability at Top of Power Pool: 32,000 Kw
 Dependable Capability - Jun-Sept: 20,000 Kw Other Months: 20,000 Kw
 Annual Primary Energy: 35.0 Kwh Average Annual Energy 96.0 Kwh
 Average flows during critical period: 1,200 Cfs. Critical Period: July 1962
to Nov. 1963. (Adjusted for depletions of 0 Cfs) Avg. Flow: 3,000 Cfs
 (Adjusted for depletions of 0 Cfs) Average Annual pumping requirements for
 pumped-storage plant 0 Kwh.

ECONOMIC DATA - BENEFITS -- FPC PSA Numbers: 25 2/

| | |
|---|-------------------|
| Capacity Value at \$ <u>15.50</u> /Kw | \$ <u>310,000</u> |
| Energy Value at \$ <u>2.4</u> mills/Kwh | \$ <u>230,000</u> |
| Cost of Pumping Energy \$ <u>-</u> /Kw | \$ <u>-</u> |
| Total At Site Power Benefits | \$ <u>540,000</u> |
| Adjustment for Downstream Benefits | \$ <u>-</u> |
| *Total Project Annual Power Benefits | \$ <u>540,000</u> |

ECONOMIC DATA - COSTS -- Interest Rate 3-1/4 %, 100-Year Amortization

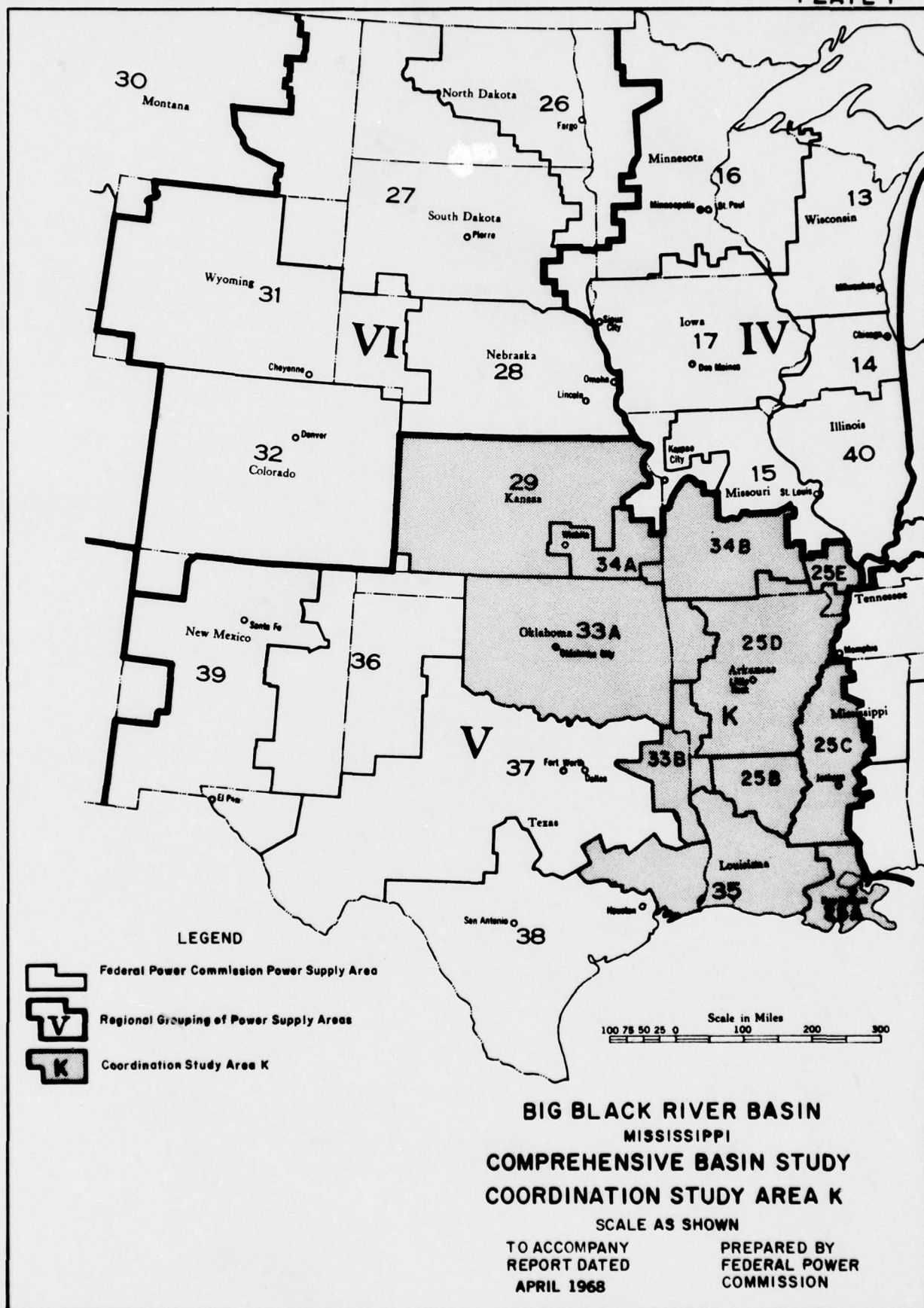
| | |
|--|----------------------|
| Separable Power (Dam & Reservoir, incremental) (Includes cost of afterbay to reregulate peak power releases if required) | \$ <u>12,420,000</u> |
| Specific Power (Intake, powerhouse & switchyard) | \$ <u>12,000,000</u> |
| Total | \$ <u>24,420,000</u> |
| Interest during Construction | \$ <u>1,981,000</u> |
| Total Investment | \$ <u>26,404,000</u> |
| Annual Costs Power: | |
| Interest & Amortization | \$ <u>895,000</u> |
| Operation, Maintenance & Replacement | \$ <u>134,000</u> |
| *Total Project Annual Power Costs | \$ <u>1,029,000</u> |

*B/C Ratio: 0.53REMARKS: 1/ Also flood control and recreation. 2/ Power value based on 1-1-66

prices, computed by Fort Worth Regional Office, Federal Power Commission.

16. CONCLUSIONS

Development of a multiple purpose project, including hydroelectric power, at the Edwards site is not economically feasible at this time. However, the ratio of annual power benefits to the annual charges against the specific power facilities is near unity. Should it be determined practicable to operate this proposed plant at a 5 or 10 percent plant factor with a larger installation, generating primarily for peaking purposes, the benefit-cost ratio for specific power facilities, under present criteria, would be somewhat greater than unity. This indicates that if at some future time a development for other purposes at this site is found to be desirable, hydroelectric power should receive careful study as a project purpose.



Within the Basin

Plant No. 23 Baxter Wilson, 500 Mw Steam

OWNERSHIP LIST

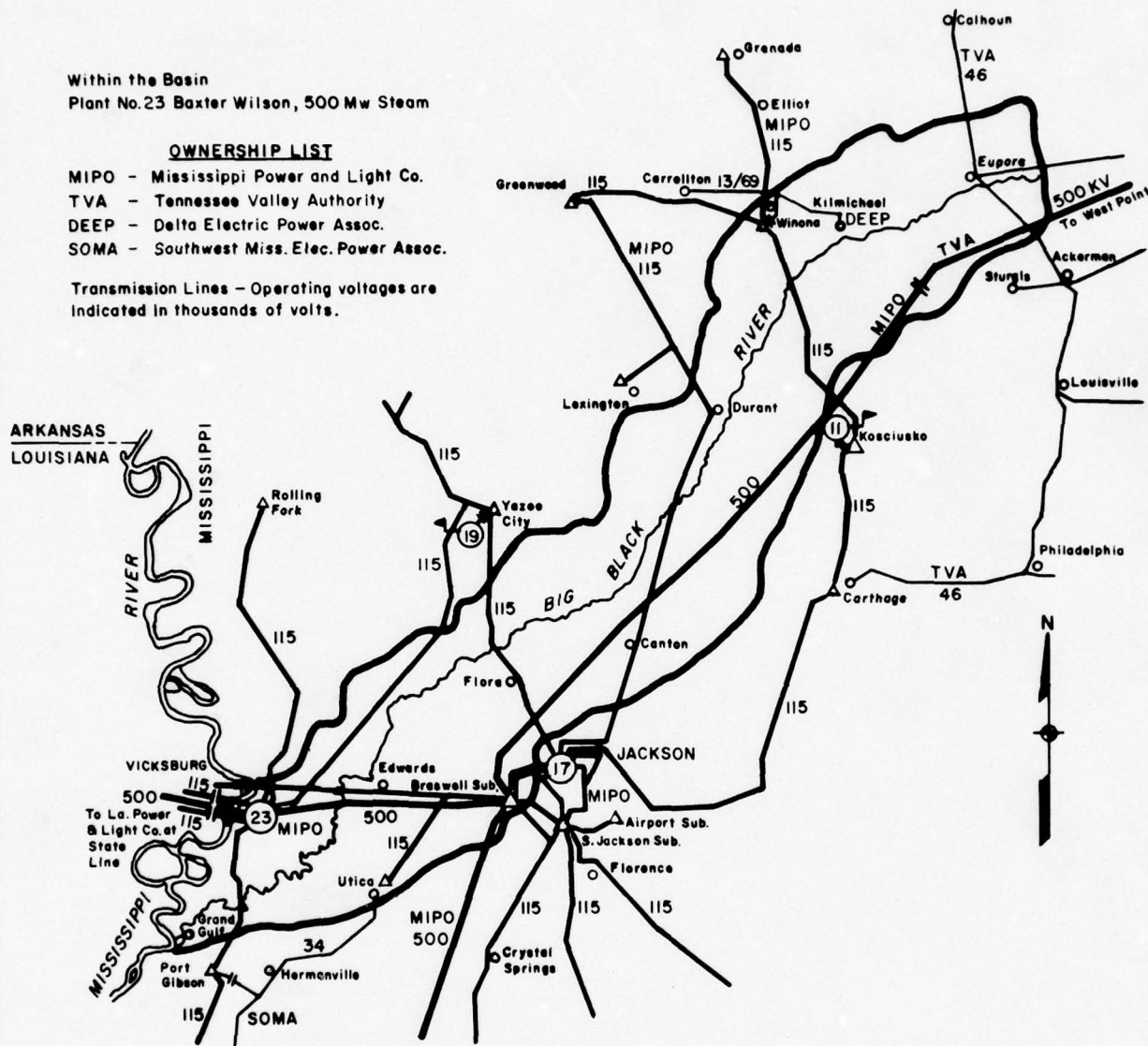
MIPO - Mississippi Power and Light Co.

TVA - Tennessee Valley Authority

DEEP - Delta Electric Power Assoc.

SOMA - Southwest Miss. Elec. Power Assoc.

Transmission Lines - Operating voltages are indicated in thousands of volts.



**BIG BLACK RIVER BASIN
MISSISSIPPI
COMPREHENSIVE BASIN STUDY
PRINCIPAL ELECTRIC FACILITIES**

SCALE AS SHOWN

TO ACCOMPANY
REPORT DATED
APRIL 1968

PREPARED BY
FEDERAL POWER
COMMISSION

PAST AND ESTIMATED
ENERGY REQUIREMENT
(NPS STUDY AREA)

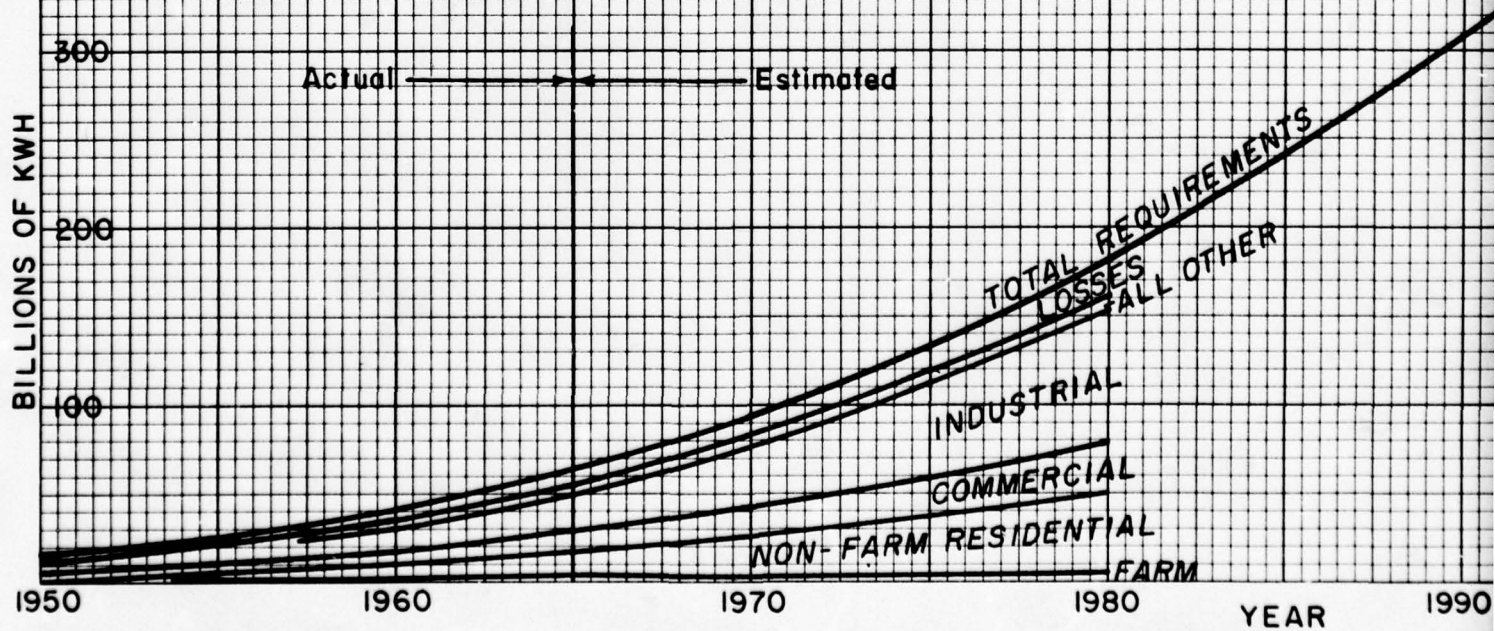


FIGURE 1

ST AND ESTIMATED FUTURE
ENERGY REQUIREMENTS
(NPS STUDY AREA K)

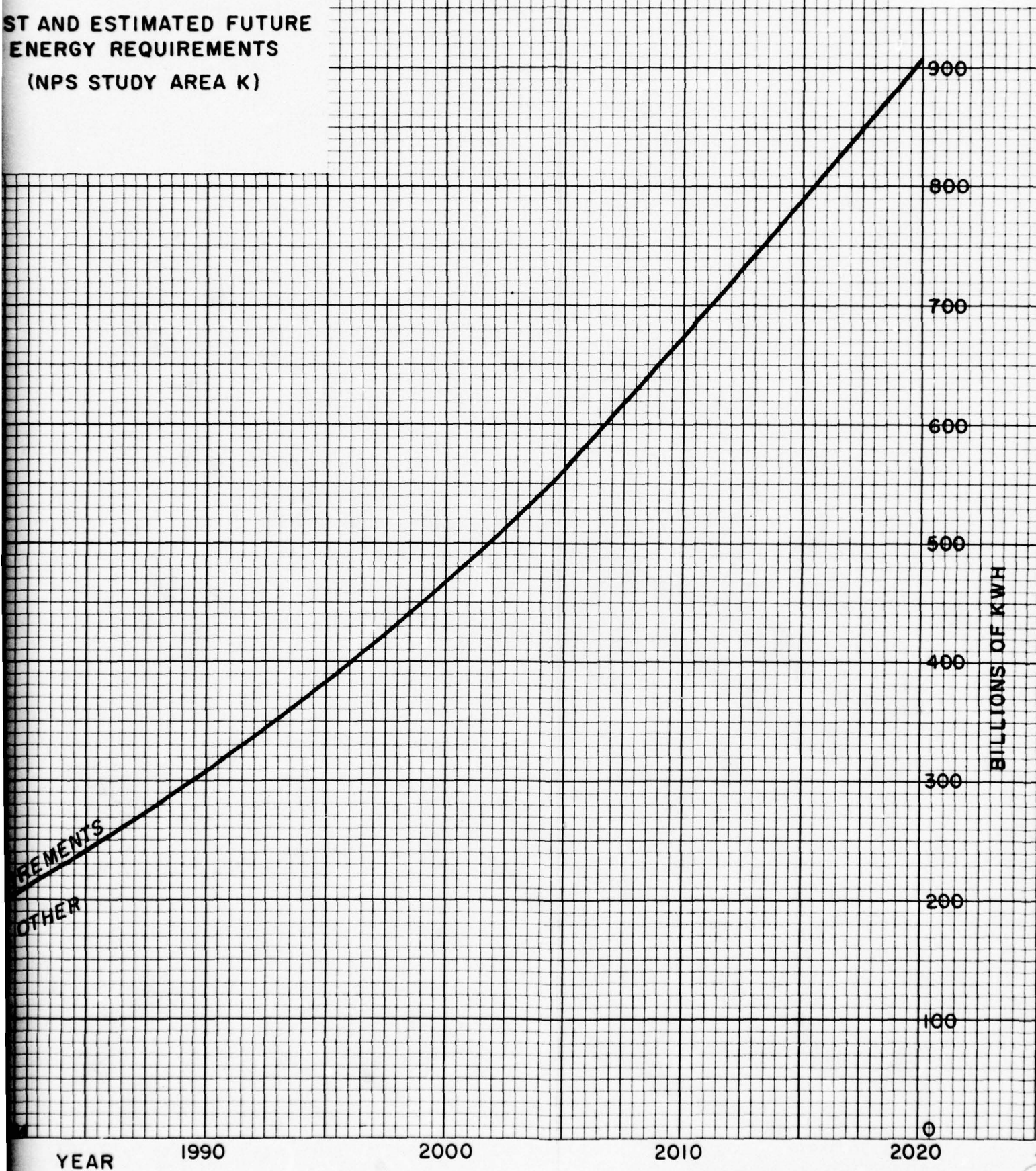


FIGURE 2

AUGUST 1980
POSSIBLE CRITICAL PERIOD OPERATION
(NPS STUDY AREA K)

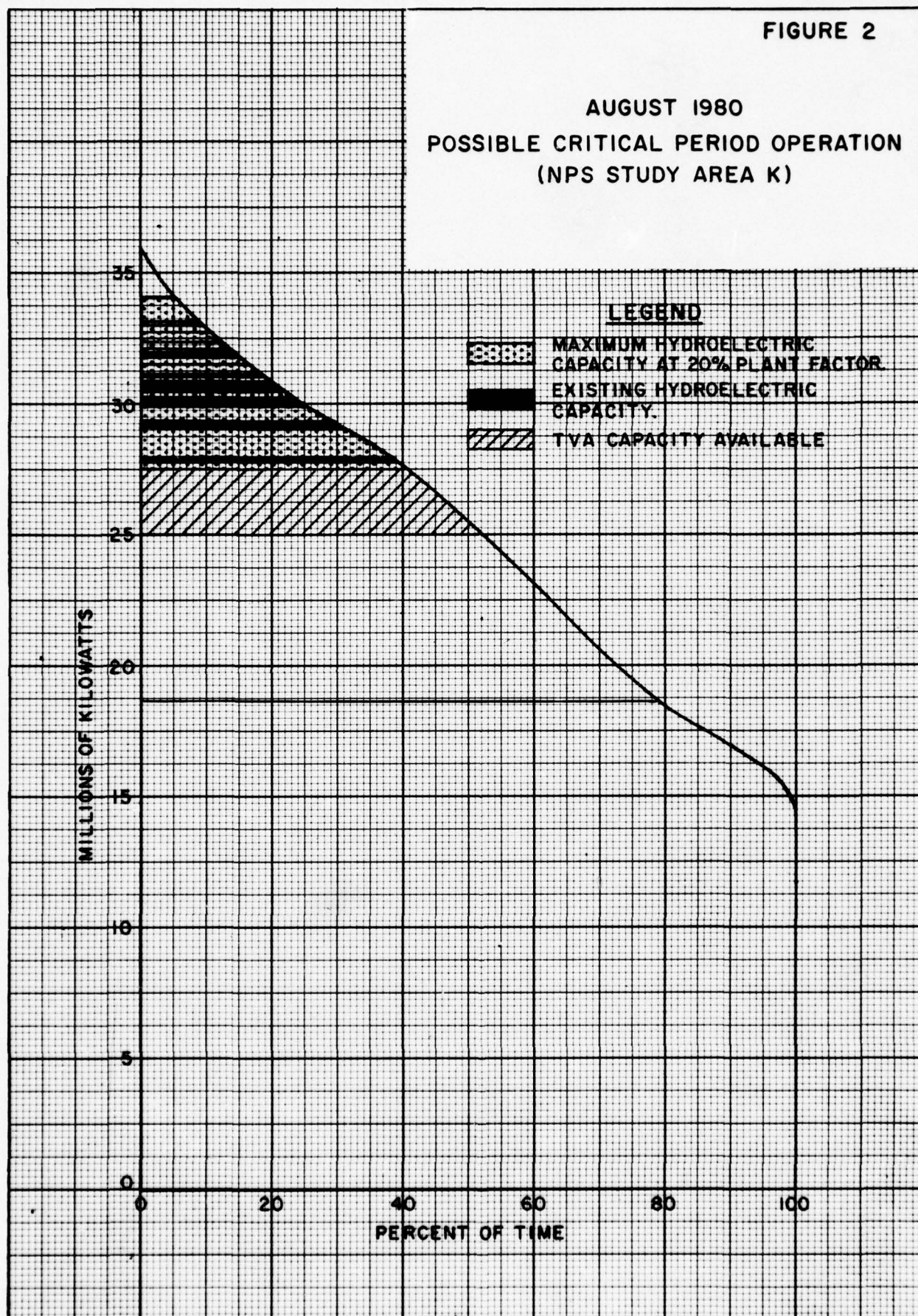


FIGURE 3

AUGUST 2000
POSSIBLE CRITICAL PERIOD OPERATION
(NPS STUDY AREA K)

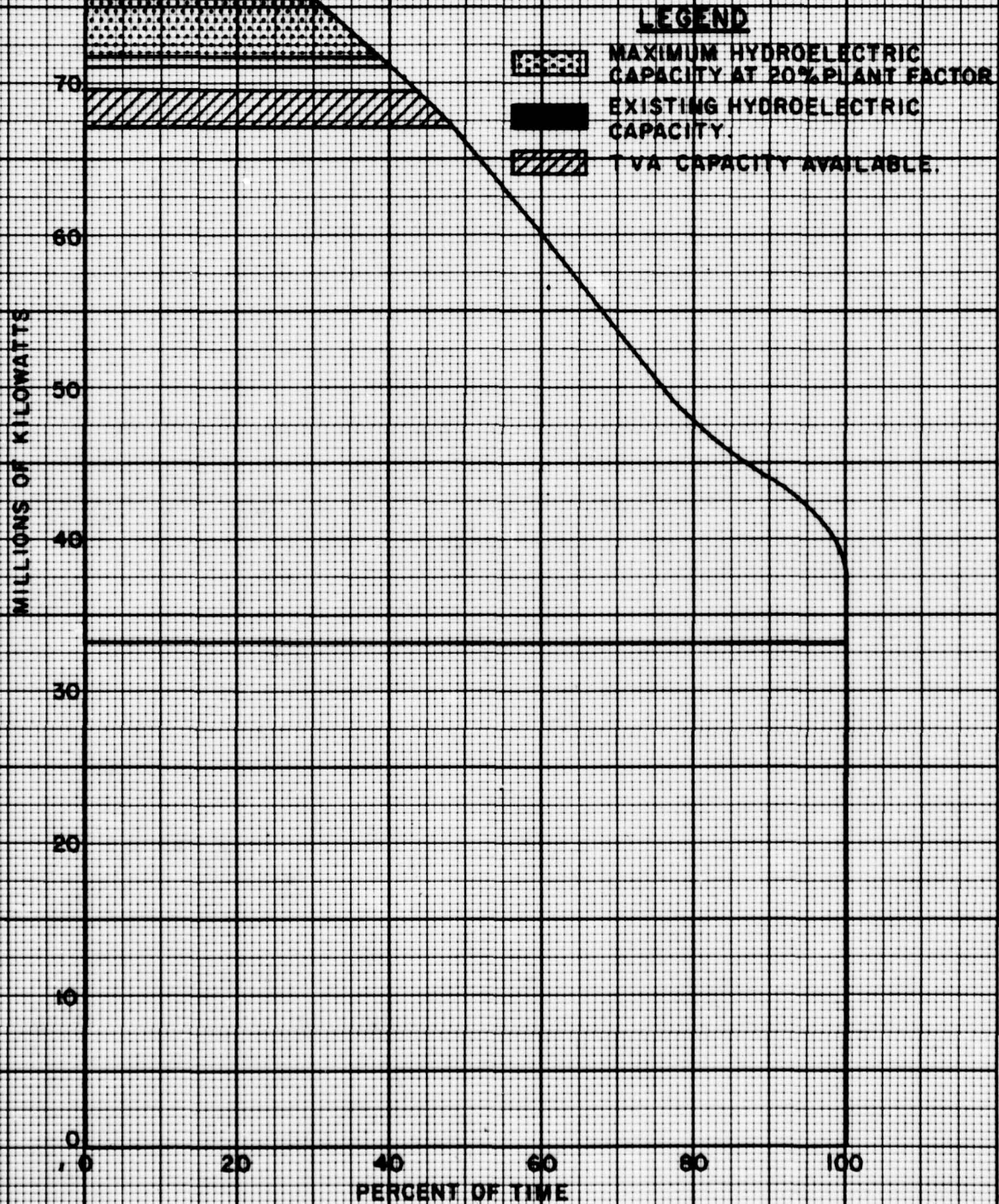


FIGURE 4

AUGUST 2020
POSSIBLE CRITICAL PERIOD OPERATION
(NPS STUDY AREA K)

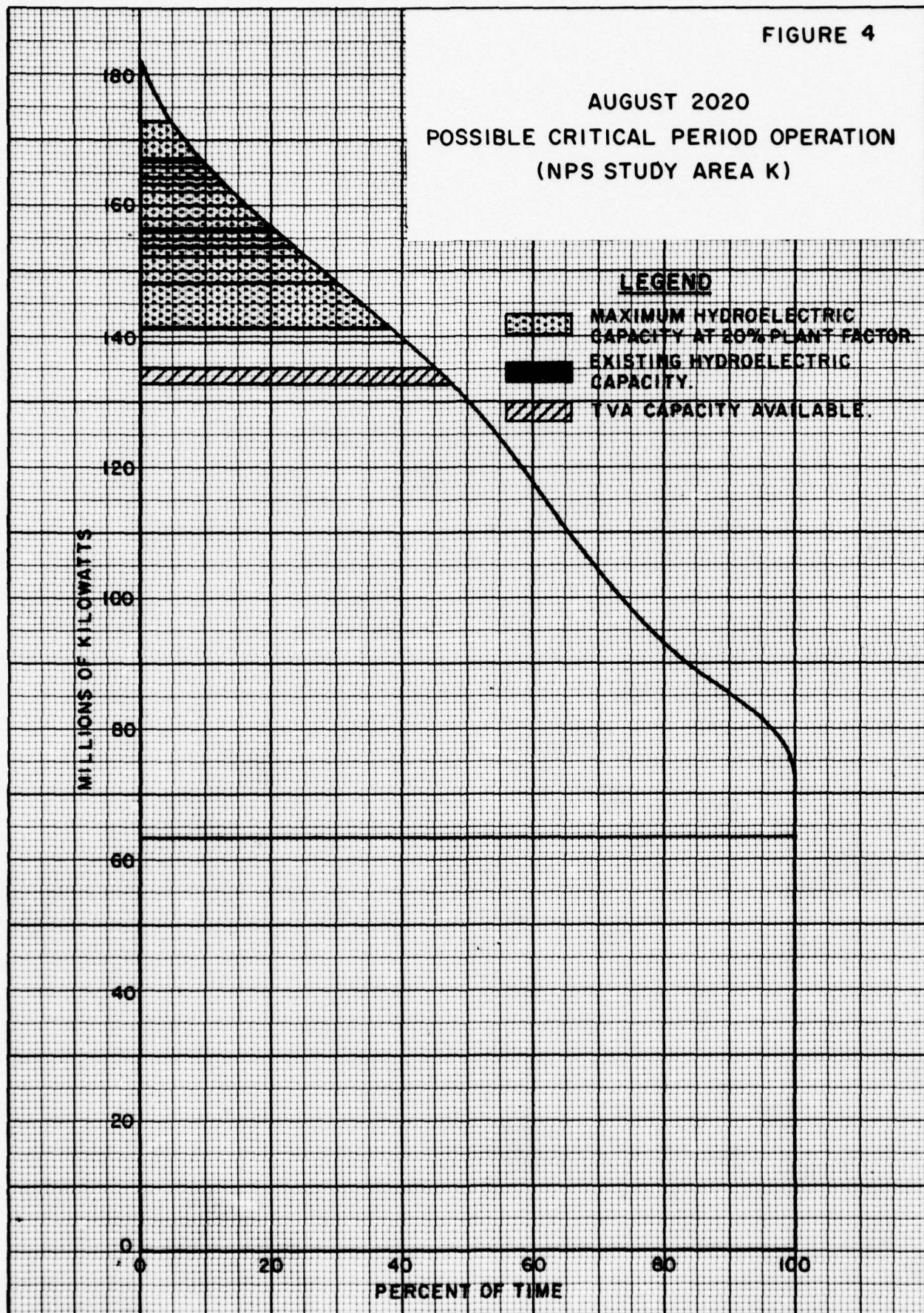
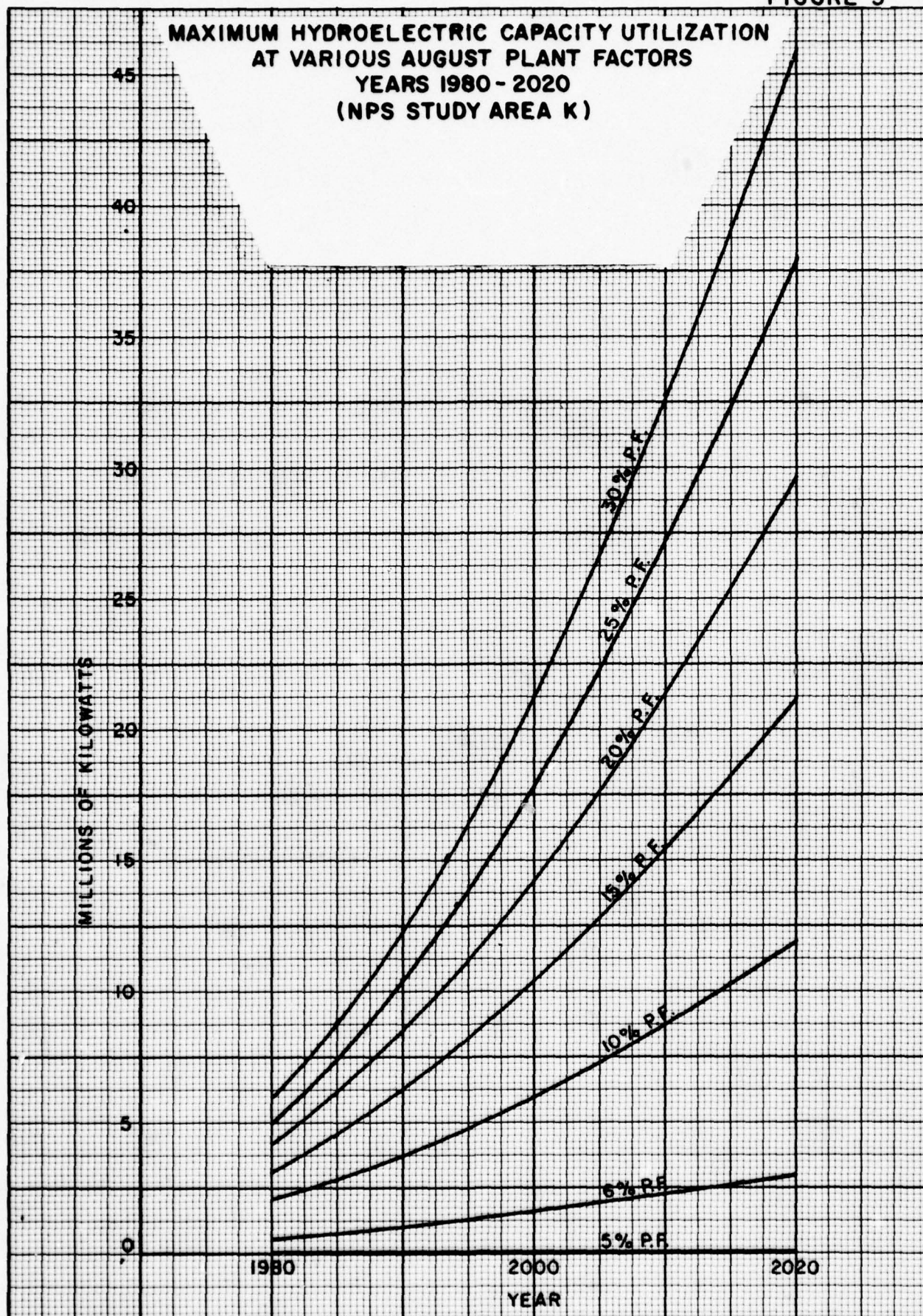


FIGURE 5

**MAXIMUM HYDROELECTRIC CAPACITY UTILIZATION
AT VARIOUS AUGUST PLANT FACTORS
YEARS 1980 - 2020
(NPS STUDY AREA K)**



One Week by Hours.

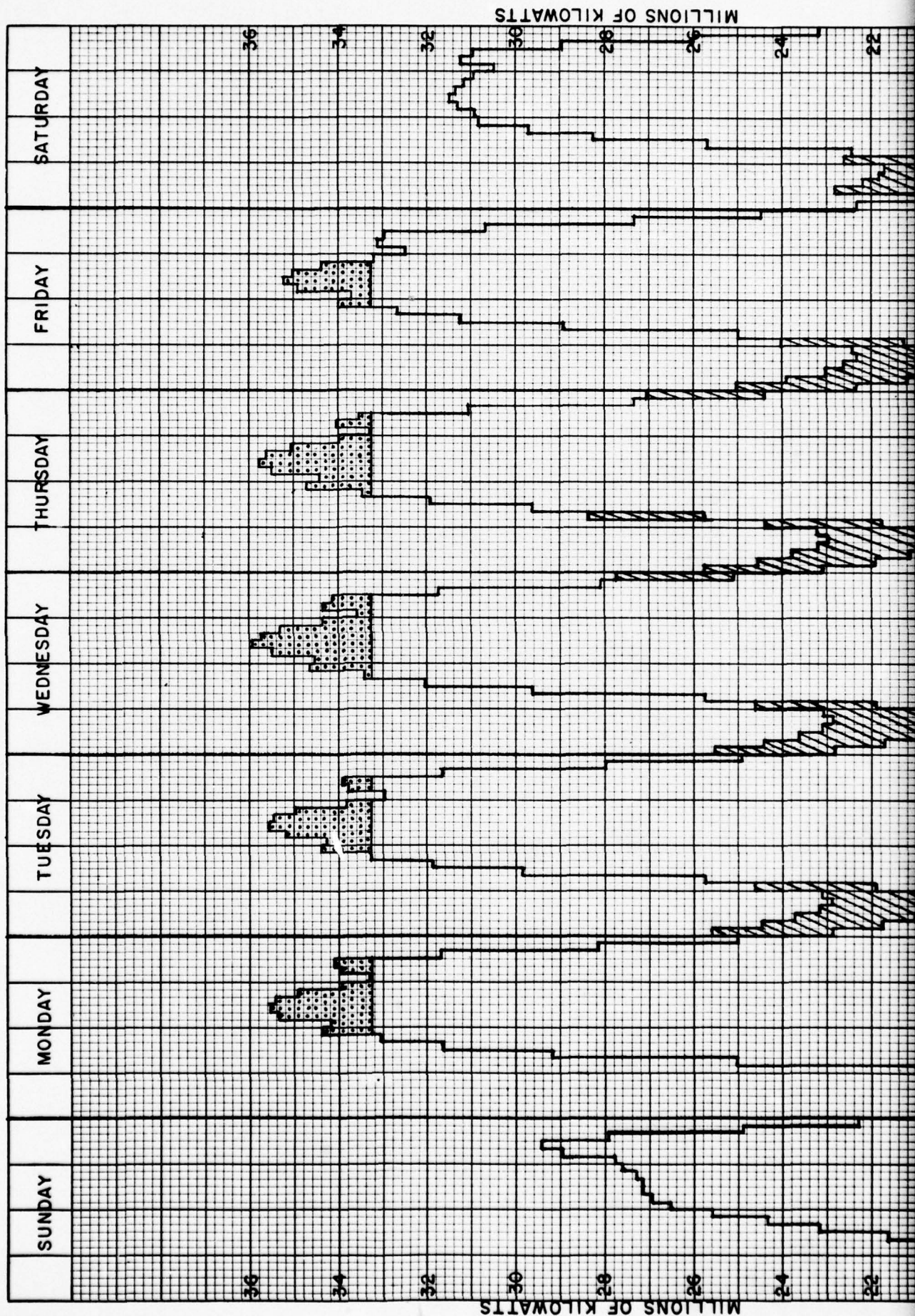


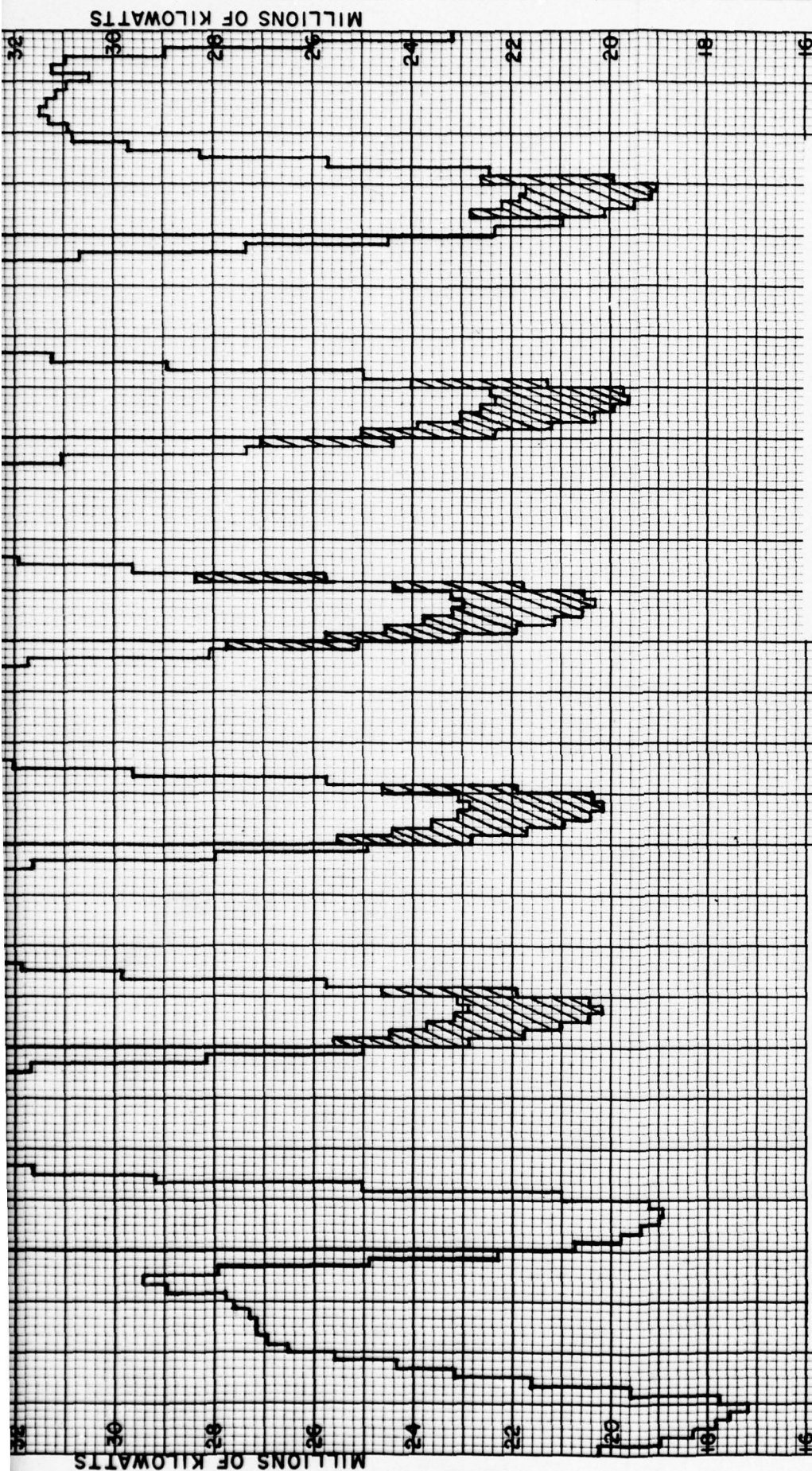
FIGURE 6

1980
ESTIMATED PEAK WEEK
SHOWING
MAXIMUM PUMPED-STORAGE CAPACITY
(NPS STUDY AREA K)

LEGEND

PUMPED-STORAGE HYDRO

PUMPING LOAD



**BIG BLACK RIVER, MISSISSIPPI
COMPREHENSIVE BASIN STUDY**

**ANNEX I
ROLE OF THE STATE OF MISSISSIPPI
IN THE PLANNING AND DEVELOPMENT OF THE WATER AND
RELATED LAND RESOURCES IN THE
BIG BLACK RIVER BASIN**

**PREPARED BY
MISSISSIPPI BOARD OF WATER COMMISSIONERS
JACKSON, MISSISSIPPI**

ANNEX I
 ROLE OF THE STATE OF MISSISSIPPI
 IN THE PLANNING AND DEVELOPMENT OF THE WATER AND
 RELATED LAND RESOURCES IN THE
 BIG BLACK RIVER BASIN

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| Exhibit D | Mississippi Water Quality Standards |

INTRODUCTION

Mississippi considers water one of its most valuable resources and has long recognized the need to provide for its development and utilization. The Constitution of the State and the Mississippi Code contains laws that pertain to water rights and to regulatory authority over water and rights to water. They further provide for the establishment of the several state agencies whose activities have impact upon the development and use of the State's water resources.

The pertinent sections of the law are scattered throughout the Constitution and the Code. The following portions of the report are the results of gathering together these sections with an application to the water resources of the Big Black River Basin.

To over simplify the situation, there are two State agencies with regulations affecting water resources development. Any withdrawal of water from streams or lakes must have a valid water right established with the Mississippi Board of Water Commissioners, and any discharge back to a stream or lake must have a permit from the Mississippi Air and Water Pollution Control Commission.

Information may be obtained from:

Water Engineer
Mississippi Board of Water Commissioners
416 North State Street
Jackson, Mississippi 39201

Executive Secretary
Mississippi Air and Water Pollution Control Commission
P. O. Box 827
Jackson, Mississippi 39205

ROLE OF THE STATE OF MISSISSIPPI
IN THE PLANNING AND DEVELOPMENT OF THE WATER AND
RELATED LAND RESOURCES IN THE
BIG BLACK RIVER BASIN

1. WATER RIGHTS

Conservation and development of water resources are only steps toward proper management and intelligent utilization. In order to provide for an orderly development, as set forth in adequate comprehensive plans, and to insure security for the capital invested for the necessary facilities for managing these resources, regulations imposed on the use and management are basic requirements. Mississippi recognized the need for water rights legislation and with the enactment of the Water Rights Law of Mississippi (Section 5956-01 et. seq. of the Mississippi Code - see Exhibit B, Appendix I) in 1956, became the first state outside of the Arid West to establish an administrative procedure for regulating water uses. Regulation of water rights is not only extended to quantity of use but is also extended to the effects of use upon quality. The Constitution and the Code include provisions relating to water rights doctrine, surface and ground water, construction of dams and storage of water, access to lakes and streams, diversion between basins, and the exercise of the right of eminent domain.

a. Doctrine. Section 5956-01 of the Mississippi Code declares that: "the general welfare of the people of the State of Mississippi requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use, or unreasonable method of use, of water be prevented, and that the conservation of such water be exercised with the view to the reasonable and beneficial use thereof in the interest of the people, and that the public and private funds for the promotion and expansion of the beneficial use of water resources shall be invested to the end that the best interests and welfare of the people are served."

It also provides that: "Water occurring in any watercourse, lake or other natural water body of the State, is hereby declared to be

among the basic resources of this state and subject to appropriation in accordance with the provisions of this Act, and the control and development and use of water for all beneficial purposes shall be in the State, which, in the exercise of its police powers, shall take such measures as shall effectuate full utilization and protection of the water resources of Mississippi."

The above declaration of policy includes both surface and ground water, but the provisions for appropriation of ground water was not implemented; in fact, the above Section further provides that: "Nothing in this Act shall be construed or interpreted as affecting ground or subterranean water rights or usage."

b. Surface water. Section 5956-04 specifies that no right to appropriate or use surface water subject to appropriation shall be initiated or acquired except upon compliance with the provisions of the Code. No person shall take water from a stream, lake, or other watercourse without having a valid right to do so.

Section 5956-16 provides for application for a permit to acquire appropriation rights to be made to a Board of Water Commissioners. A permit is not required for utilization of up to 300 acre feet of the impounded water from a reservoir in a stream having a minimum flow of not more than one-half million gallons per day. However, the Board has established procedures for these expected uses, and upon receipt of the proper form, will supply the water user with an Order of Determination to be recorded in the office of the Chancery Clerk in the county in which the reservoir is located. This record of all valid water rights is important in the administration of the law, and aids in an orderly development of all of the water resources.

Section 5956-20 requires that a written statement from the Board be obtained by persons desiring to build a dam or reservoir on any stream with a minimum flow of more than one half million gallons of water per day. The statement must indicate that the construction will not adversely affect plans for the proper utilization of the water resources of the State. If the stream is in a levee district, a

copy of a resolution adopted by the levee board approving the construction must also be presented to the Board of Water Commissioners.

Section 5956-23 authorizes the Board of Water Commissioners to consider, approve, modify at the request of the applicant, or reject applications for permanent or temporary changes in the place of diversion or use of water from those originally appropriated or approved.

Surface water appropriation is made equal to other property rights. Section 5956-05 specified that no water appropriation acquired pursuant to law shall be declared forfeited and surrendered, except by a court of competent jurisdiction, as other property rights are determined. However, after good cause has been shown, the Board of Water Commissioners may modify or terminate any appropriation at any time.

Obstruction of navigable streams is punishable by fines and/or imprisonment (Sections 2210, 2211, 2415.5, 8289, and 8416), and discharge of waste into streams is regulated (Section 7106-101 et seq.).

The Code contains provisions for several special groups to affect the management of surface water. Municipalities may establish, alter, and change the channels of streams or watercourses (Section 3374.122) and may erect, purchase, maintain and operate waterworks (Section 3374.130). County boards of supervisors may, for authorized flood control improvements of the United States, provide lands, easements, and rights of way; may hold and save the United States free from damage; and may maintain and operate the improvements upon completion (Sections 4767-4768).

Drainage districts and water management districts are established to further soil and water conservation and utilization programs in cooperation with the United States and landowners and to strengthen flood control and drainage programs (Sections 4576-4766.07). Flood control districts are established (Sections 4769-4826.01) to cooperate with the United States in construction of flood control improvements. Master water management districts, to plan for works of improvement

developed and carried out in cooperation with the Secretary of Agriculture under the provisions of Public Law 566, 83rd Congress, are authorized by Section 5956.101.

Special river basin districts have been authorized by action of the Mississippi Legislature, including: the Big Black River Basin District, the Pat Harrison Waterway District, the Pearl River Basin Development District, and the Tombigbee River Valley Water Management District. Other districts authorized for more limited purposes include: the Pearl River Valley Water Supply District, the West Central Mississippi Waterway Commission, the Lower Mississippi River Basin Development District, and the Lower Yazoo River Basin District.

c. Ground water. Rights to ground water are specifically exempted from the sections of the Code pertinent to conservation and development of water resources (Section 5956-01 [c]).

Sections 5956-31 - 5956-40.2 require that every person, firm, or corporation desiring to engage in the business of drilling wells for underground water shall apply to the State Board of Water Commissioners for a drilling license. Furthermore, drillers are required to report each well to the Board and file a driller's log within thirty days after a well has been completed. No license is required for a person to drill a well on his own property when intended for use in his single family, permanent residence or for watering livestock, provided the waters are not to be used by the public.

d. Access to lakes and streams. Access to lakes and streams is generally provided through the exercise of eminent domain. See page 6 of this report.

Several groups are empowered to provide access: county boards of supervisors, drainage district commissions, water management commissions, master water management commissions, flood control district commissions, and river basin districts which include the authorized Big Black River Basin District.

e. Diversion between basins. With the enactment of the Water Rights Act in 1956, the Board of Water Commissioners was provided with

the necessary authority to approve the diversion of surface water from one drainage basin to be used in others.

Power is given the governing authority of municipalities by Section 3374.122 to establish, alter, or change the channels of streams or watercourses to promote the health, comfort, and convenience of the inhabitants. Drainage district commissions (Section 4739), water management district commissions (Section 4606.7), master water management district commissions (Section 5956.108), and flood control district commissions (Sections 4803 and 4803.01) may construct dams and bypasses for conveying overflow water from a stream so long as the water is discharged back into the same watercourse or another within thirty-five miles from the mouth thereof. However, Section 5956-29 repeals all acts or parts of acts, inconsistent with the Water Rights Act passed in 1956. It then appears that the various districts, in the exercise of their authority, must comply with the provisions of Section 5956.01 et seq.

f. Eminent Domain. Section 17 of Article 3, the Bill of Rights, provides that private property shall not be taken for or damaged by public use, except on due compensation being first made to the owner in a manner prescribed by law. Sections 2747 through 2782 of the Mississippi Code established the procedures and regulations to be used in the exercise of the right of eminent domain. Several sections of the Code specifically relate the right of eminent domain to the water resource of the State. Water rights, acquired under provisions of the 1956 Act, are also property rights (Section 5956-05), and must be considered when right of eminent domain is exercised.

2. REGULATORY AUTHORITY

Water, being a moving resource, does not respect property lines or boundary lines between political subdivisions, and use of water by any one person will be available for use by others. To avoid some of the confusion as competition for use increases, regulatory authority has been provided by the Constitution and the Code of the State of Mississippi.

The sections of the Code and the Constitution which are pertinent to the several needs for regulation follow:

a. Permits or approval required.

(1) For drilling or abandoning wells.

(a) No permit is required for drilling or abandoning any specific water well in Mississippi. However, every person, firm, and corporation desiring to engage in the business of drilling wells for underground water must apply to the State Board of Water Commissioners for a drilling license (Section 5956-31). Licenses are renewable annually. Persons constructing a water well on their own properties for their own specified domestic and farm uses are not required to obtain a license.

(b) Within thirty days after completion of a water well, the driller must file a report in the office of the State Board of Water Commissioners.

(2) For impoundments.

(a) The Mississippi Code, Section 5956-04(b), provides for construction and maintenance, without a permit but subject to the common law and other lawful water rights of others, of a dam on any stream having a minimum flow of not more than one-half million gallons of water per day and utilization of up to 300 acre feet of the impounded water so long as such action does not affect the established average minimum flow in the stream below the dam. A water user may request the Board of Water Commissioners to establish his rights to use the impounded water and to issue an order of determination that is recorded in the office of the Chancery Clerk in the county where the dam is located.

(b) Before dams or reservoirs are constructed on streams other than those described above, a written statement to the effect that the construction will not adversely affect plans for the proper utilization of the water resources of the State must be obtained from the Board of Water Commissioners (Section 5956-20).

(c) Drainage district commissions (Section 4606.5 [1]) and flood control district commissions (Sections 4793 and 4803) are authorized to impound waters and operate and maintain the structures in pursuit of their authorized objectives, as are master water management districts (Section 5956.108), water management districts (Section 4606.7), the Big Black River Basin District (Section 5956.257), and other river basin districts. However, the various districts must comply with the provisions of Section 5956-01 et seq.

(3) For channel encroachments.

(a) Section 81 of the Mississippi Constitution of 1890 provides that the legislature shall never authorize the permanent obstruction of any of the navigable waters of the State, but may provide for the removal of such obstructions as they existed, whenever the public welfare demands.

(b) While permanent obstruction of navigable waters is made a misdemeanor (Section 2414 of Code), several sections provide for encroachments. Flood control districts (Section 4803) and municipalities (Section 3374.134) are permitted to encroach within certain limits. Pipelines and wires are permitted to cross streams under certain conditions. The several river basin districts, including the Big Black River Basin District (Section 5956.227), are authorized to make certain encroachments in furtherance of their authorized objectives.

(4) For discharge of waste.

(a) Sections 7106.111 - 7106.136 of the Mississippi Code established a Mississippi Air and Water Pollution Control Commission and empowered it to control, prevent and abate pollution of surface and underground waters of the State. (See Appendix 1, Exhibit C.)

(b) Permits from the Commission may be required for the activities listed below which may cause wastes to be discharged into the waters of the State:

1. The construction, installation, modification or operation of any disposal system or part thereof any extension or addition thereto;

2. The increase in volume or strength of any wastes in excess of the permissive discharges specified under any existing permit;

3. The construction, installation, or operation of any industrial, commercial, or other establishment, including irrigation projects or any extension or modification thereof or addition thereto, the operation of which would cause an increase in the discharge of wastes into the waters of the State or would otherwise alter the physical, chemical or biological properties of any waters of the State in any manner not already lawfully authorized; or

4. The construction or use of any new outlet for the discharge of any wastes into the waters of the State.

(c) The Air and Water Pollution Control Commission is authorized to utilize the services of other agencies, and to delegate portions of its responsibilities to them, until such time as the Commission has developed the capabilities to carry out the functions with its own staff and facilities. This authority will expire July 1, 1968.

(5) For construction of public water supply.

(a) Permits and approvals required for construction of impoundments for public water supply are the same as those indicated in this report for impoundments, page 7.

(b) Section 3374.130 of the Mississippi Code authorizes the governing authorities of municipalities to erect, purchase, maintain, operate, and regulate waterworks. The major water resource management districts and the river basin districts, including the Big Black River Basin District (Section 5956-228), may assist municipalities in provision of adequate water supplies.

b. Water quality.

(1) Waste treatment.

(a) Sections 7106.111 - 7106.136 of the Mississippi Code, enacted in 1966, provides for regulation of waste treatment by the Mississippi Air and Water Control Commission. (See Appendix I, Exhibit C.) Some of its responsibilities may be delegated to other specified State agencies until such time as the Commission has been able to develop its staff and facilities. Any delegation of this responsibility will expire July 1, 1968. Various sections of the Code have dealt with pollution of the waters of the State and different agencies were provided with authority to control water pollution, but Section 7106.133 repealed all statutes in conflict with the new pollution act.

(b) Section 5956.04(e) forbids appropriation of water by the Board of Water Commissioners if such appropriation will impair the effect of stream standards set under the pollution control laws based on minimum average stream flow.

(2) Flow regulation.

(a) Section 5956.04(a) provides that no water may be taken from a stream, lake, or other watercourse except upon compliance with the water rights act, administered by the Board of Water Commissioners.

(b) Section 5956.04(c) provides that the Board of Water Commissioners shall have the authority to permit the appropriation of water of any stream only in excess of the established average minimum flow as based upon records or computations by the Board.

(c) Section 5956.04(e) provides that the Board shall not authorize an appropriation from a stream that will impair the effect of stream standards set under pollution control laws of the State based upon a minimum average stream flow.

(d) Sections 5956.04(b) and 5956.20 require that certain stream flows be maintained below dams constructed on streams in

Mississippi. Storage for stream flow augmentation that is constructed in reservoirs may be protected by rules and regulations of the Board of Water Commissioners.

3. BIG BLACK RIVER BASIN DISTRICT

During the 1964 Regular Session of the Mississippi Legislature, an act was passed to enable the creation of the Big Black River Basin' District. (See Appendix 1, Exhibit A).

The district can be created when at least five of the eleven eligible counties complete the procedures prescribed in the Act.

Creation of the district will provide a means to coordinate plans and programs for the development of the land and water resources of the Big Black River Basin.

The proposed district will have the financial capability to assure payment of the local share of costs of many future projects.

APPENDIX I

EXHIBITS A, B, C, AND D

EXHIBIT A

ENABLING ACT FOR CREATION OF
BIG BLACK RIVER BASIN DISTRICT

EXHIBIT A
ENABLING ACT FOR CREATION OF
BIG BLACK RIVER BASIN DISTRICT

5956-221. Big Black River Basin District-legislative determination.

(a) It is hereby declared, as a matter of legislative determination, that the soil of the State and the waterways and surface waters of the State are among its basic resources; that the soil and the overflow and surface waters of the State have not heretofore been conserved to realize their full beneficial use; that the utilization, development, conservation and regulation of such soil and waters are necessary to insure an adequate flood control program and a sanitary water supply at all times, to promote the balanced economic development of the State and to aid in conservation and development of the soils and forests of the State, irrigation of lands needing irrigation, navigation and pollution abatement. It is further determined and declared that the preservation, conservation, storage and regulation of the waters of the Big Black River and its tributaries and their overflow waters for domestic, commercial, municipal, industrial, agricultural and manufacturing purposes, for recreational uses, for flood control, timber development, irrigation, navigation and pollution abatement, and for the preservation, conservation and development of the soil of the Big Black River Basin are, as a matter of public policy, for the general welfare of the entire people of the State.

(b) It is hereby further declared, as a matter of legislative determination, that the creation of the Big Black River Basin District is determined to be necessary and essential to the accomplishment of the aforesaid purposes and that this act operates on a subject in which the State at large is interested.

SOURCES: Laws, 1964, ch. 249, par. 1.

5956-222. General authority to organize.

The Big Black River Basin District may hereafter be organized in this State under the provisions of this act in the manner hereinafter provided for, and when so organized, the Big Black River Basin District shall be an agency of the State and a body politic and corporate.

SOURCES: Laws, 1964, ch. 249, par. 2.

5956-223. Board of directors.

All powers of the district shall be exercised by a board of directors to be selected and composed as follows:

(a) The Board of Water Commissioners, the State Game and Fish Commission, the Forestry Commission and the State Board of Health of the State of Mississippi shall each appoint one (1) director from that department to serve on the Board of Directors of the Big Black River Basin District, each such director to serve at the pleasure of the respective board appointing him, but not to exceed a six-year term. Provided, however, if possible that each of such directors must reside within one of the twelve (12) counties composing the district.

(b) The board of supervisors of each county which elects to become a member of the district shall appoint two (2) directors from that county, each of whom shall serve for a term of six (6) years or until his successor is appointed by the board of supervisors of that county and qualified; provided that in making its initial appointment of directors, the board of supervisors of each member county shall appoint one (1) of its two (2) directors to serve for a term of three (3) years or until his successor is appointed and qualified.

(c) The Governor of the State of Mississippi shall appoint four (4) directors residing within the district, each of whom shall serve for a term of six (6) years or until his successor is appointed by the Governor and qualified.

(d) Each director shall take and subscribe to the general oath of office required by Section 268 of the Constitution of the State of Mississippi, before a chancery clerk, that he will faithfully discharge the duties of the office, which oath shall be filed with the said clerk and by him preserved.

(e) Each director shall receive a per diem not to exceed Twenty Dollars (\$20.00) per day for attending each day's meeting of the board and for each day spent in attending to necessary business of the district, and, in addition, he may receive reimbursement for actual mileage traveled at the rate of Seven Cents (7 cents) per mile, upon express authorization of the board.

(f) The board of directors shall annually elect from its number a president and vice-president of the district, and such other officers as in the judgement of the board are necessary. The president shall be the chief executive officer of the district and the presiding officer of the board, and shall have the same right to vote as any other director. The vice-president shall perform all duties and exercise all powers conferred by this act upon the president when the president is absent or fails or declines to act, except the president's right to vote. The board shall also appoint a secretary and a treasurer who shall be members of the board, and it may combine those offices. The treasurer shall give bond in the sum of not less than Fifty Thousand Dollars (\$50,000.00) as set by the board of directors, and each director may be required to give bond in the sum of not less than Ten Thousand Dollars (\$10,000.00) with sureties

qualified to do business in this State, and the premiums on said bonds shall be an expense of the district. Each bond shall be payable to the State of Mississippi; the condition of each such bond shall be that the treasurer or director will faithfully perform all duties of his office and account for all money or other assets which shall come into his custody as treasurer or director of the district.

(g) Except as provided in the first paragraph of Section 8 (paragraph 5956-228), all business of the district shall be transacted by the affirmative vote of a majority of the total membership of the board of directors at a regular meeting duly called and held for such purpose.'

(h) The State Auditor of Public Accounts shall annually audit the books and records of the district and make a report thereof to the Governor and the Legislature.

SOURCES: Laws, 1964, ch. 249, par. 3.

5956-224. Counties which may become members of district.

Any county bordering on the Big Black River or any of its tributaries and any county through which the Big Black River or any of its tributaries runs may be included in the district. Each such county shall be considered a part of the Big Black River Basin. The counties within the Big Black River Basin and eligible to become members of the district are as follows: Montgomery, Choctaw, Attala, Webster, Carroll, Madison, Hinds, Claiborne, Holmes, Yazoo and Warren.

SOURCES: Laws, 1964, ch. 249, par. 4.

5956-225. Creation of district-procedure-election if required.

(a) Within twenty (20) days after the passage of this act, the Board of Water Commissioners, the State Game and Fish Commission, the Forestry Commission, and the State Board of Health of the State of Mississippi shall appoint their respective members to the proposed district board of directors as provided in Section 3 (5956-223 of Code). These four (4) appointive members, upon taking the oath as provided, shall meet in the office of the Board of Water Commissioners in Jackson, Mississippi within ten (10) days and adopt by a majority vote a resolution setting forth their intentions of creating the district and shall forthwith send a certified copy of said resolution to:

(1) The Governor;

(2) Executive officers of the Board of Water Commissioners, State Game and Fish Commission, Forestry Commission and State Board of Health; and

(3) The president of the Board of supervisors and the chancery clerk of each county which is part of the Big Black River Basin.

After receipt of said resolution, each of the four (4) State agencies hereinabove named may adopt its own resolution favorable or unfavorable to the creation of said district; and the respective boards of supervisors may, at their next regular meeting or at any subsequent meeting likewise adopt a resolution favorable or unfavorable to creating said district. All of said resolutions adopted shall be certified by adopting body's secretary, clerk or executive officer and certified copies shall be filed with each State agency and political subdivision named in this section.

(b) The board of supervisors of any county which is part of the Big Black River Basin and which desires to become a member of the district shall, upon receipt of the certified resolution to be adopted by the four (4) initial directors, declare said board's intentions by adopting a resolution expressing its desire to have said district created and stating that its county desires to be a member thereof and stating that said board desires and intends to levy a special ad valorem tax not to exceed one-half ($\frac{1}{2}$) mill on all taxable property within said county for the use and benefit of the Big Black River Basin Development District, if and in the event that other funds of that county are not available and appropriated to pay for that county's required contribution to said district. The said resolution shall be published once each week for three (3) consecutive weeks in some newspaper published in the county and having a general circulation therein; if within twenty-one (21) days after the date of the first publication of said resolution no petition signed by ten per cent (10%) of the qualified electors of the county is filed with the board of supervisors requesting the calling of an election on the question of the county's participation in the district and the levying of the special ad valorem tax not to exceed one-half ($\frac{1}{2}$) mill as aforesaid, then the board of supervisors may without an election proceed to have the county made a member of said district and to levy the special ad valorem tax not to exceed one-half ($\frac{1}{2}$) mill if and when required at any time within two years after the date specified in the aforesaid resolution; but if within twenty-one (21) days after the date of the first publication of said resolution a petition is filed, signed by at least ten per cent (10%) of the qualified electors of said county, requesting an election on the proposition of said county's becoming a member of the proposed district and the levying of the special ad valorem tax not to exceed one-half ($\frac{1}{2}$) mill as herein provided, then said election shall be held and conducted as now provided by law for such election after giving notice as provided in Section 2926-06 of the Mississippi Code of 1942. If such an election is held and a majority of those voting therein vote for the proposition, the board shall, by appropriate resolution, bring the county into the district and levy the special ad valorem tax not to exceed one-half ($\frac{1}{2}$) mill as provided by this act, if required. If the majority of those voting in such election shall vote against the proposition, then the county shall not become a member of the district nor levy the one-half ($\frac{1}{2}$) mill tax and no further election shall be so conducted until the lapse of two (2) years after the last election,

provided, however, that the board of supervisors in its discretion, may nevertheless call an election on said question after giving notice as hereinabove set out, in which event it shall not be necessary to publish the resolution declaring its intent as hereinabove set out. If the election shall carry for the proposition as hereinabove set out, the board of supervisors shall bring the county into the district by proper resolution and levy the necessary tax herein provided. If the election does not carry for the proposition as above provided, the county shall not become a member of the district.

(c) Whenever an aggregate of five (5) counties shall have become members of the Big Black River Basin District in the manner provided in this section, the said district shall be created as an agency of the state and body politic and corporate with all the powers granted to it by statute, at which time the Governor shall appoint the four (4) directors to be appointed by him.

(d) Any eligible county may become a member of the district subsequent to its creation, in the manner that the original counties became members; new member counties shall have the same power and authority and be entitled to equal consideration of the district's board of directors, not inconsistent with the purpose of this act.

SOURCES: Laws, 1964, ch. 249, par. 5; 1966, ch. 271, par. 1, eff from and after passage (approved June 16, 1966).

CROSS REFERENCES: Registration and Elections par. 320⁴ et seq.

5956-226. Payments to district-special tax levy.

(a) The board of supervisors of each county becoming a member of the district shall annually, on or before March 15 of each year beginning with the calendar year 1965, pay or cause to be paid to the depository of the district a sum equal to one-half ($\frac{1}{2}$) mill on all of the taxable property within the county, beginning with the tax assessment for the calendar year 1964, payable on or before March 15, 1965; and such payments shall be made and continued as long as the district remains in existence and there is need therefor; the board of supervisors of each county shall annually provide the district a sum equal to one-half ($\frac{1}{2}$) mill on all taxable property within the county by virtue of a tax levy on such property, or in lieu of a tax levy, the board of supervisors may appropriate an equivalent sum from the general or other funds of the county. Provided, however, that no county shall be obligated or required to levy any tax or make any contribution hereunder for the support of the district for any year, unless and until the board of directors of the district shall have filed with the board of supervisors of any such county a detailed and itemized account of the income and the expenditures of the district for and during the preceding year, which account shall be certified by the State Auditor of Public Accounts, and also have filed a detailed budget of the district for the ensuing year with the board of supervisors of any such county.

(b) Any municipality or county which is within the territorial limits of the district may advance funds to the district to pay the preliminary expenses of the district, including engineer's reports, organization or administration expenses, on such terms of repayment as the governing body of such municipality or county shall determine. Notwithstanding the provision of any law to the contrary, any such municipality or county is authorized and empowered to borrow money for a period not to exceed one (1) year from the date of such borrowing for the purpose of making such advances. The board of directors of the district is hereby authorized to repay any such advances from the monies of any funds possessed by the district.

SOURCES: Laws, 1964, ch. 249, par. 6.

5956-227. Powers of district.

The Big Black River Basin District, through its board of directors, is hereby empowered:

(a) To develop in conjunction with the U. S. Army Corps of Engineers, U. S. Secretary of Agriculture, U. S. Secretary of the Interior, or with such other Federal and/or State agency as may be involved, plans for public works of improvement for the preservation, conservation, development, storage and regulation of soil and waters within the Big Black River Basin, including the impoundage, diversion, flowage and distribution of waters for beneficial use, and development of waters for navigation and the prevention of flood water damage; to enter into agreements with the United States of America, as represented by the U. S. Army Corps of Engineers or by such other Federal agency as may be involved, to meet the requirements of local cooperation for flood control and navigation projects or other use of water as set out and authorized by public law of the United States, as now or hereafter amended.

(b) To sue and be sued in its corporate name.

(c) To adopt, use and alter a corporate seal.

(d) To make bylaws for the management and regulation of its affairs.

(e) To make or cause to be made or to cooperate in making engineering surveys, feasibility studies and cost-benefit estimates relating to the construction of dams, reservoirs, works, plants or any other necessary related facilities, for controlling, storing, using and distributing, including to adjacent basins, the waters within the Big Black River Basin or for the prevention of flood water damage or for navigation therein or for the use of its water resources for recreational purposes; and to advance funds and/or personnel to any cooperating agency for the purposes of accelerating of planning of any small watershed projects.

(f) To acquire by purchase, lease, gift, or in other manner, other than by condemnation, and to maintain, use and operate any and all property of any kinds, real, personal or mixed, of any interest therein, within the boundaries of the district necessary for the purposes of the district.

(g) To make contracts and to execute instruments necessary to the exercise of the powers, rights, privileges and functions conferred upon the district by this act.

(h) To apply for and accept grants or loans from the United States of America or from any corporation or agency created or designated by the United States of America, and to ratify and accept applications heretofore or hereafter made by voluntary associations to such agencies for grants to construct, maintain or operate any project or projects which hereafter may be undertaken or contemplated by said district.

(i) To employ engineers and attorneys and all agents and employees necessary to the exercising of the powers, rights, privileges or functions conferred upon the district by this act.

(j) To do any and all other acts or things necessary to the exercising of the powers, rights, privileges or functions conferred upon the district by this act or any other act of law.

SOURCES: Laws, 1964, ch. 249, par. 7.

CROSS REFERENCES: 5956-211, this title.

5956-228. Additional powers of the district.

At such time or times as (1) a majority of the counties named in Section 4 [par. 5956-224] of this act shall have become and are members of the district, (2) the district shall have, pursuant to the foregoing section, developed plans for one or more projects for soil conservation and/or for the preservation, conservation, storage and regulation of waters of the Big Black River and its tributaries, or any parts thereof, for domestic, commercial, municipal, industrial, agricultural and manufacturing purposes, for recreational uses, for flood control, timber development, irrigation, navigation, and pollution abatement, or any one or combination of such purposes, (3) such plans shall have been recommended as feasible and practicable by the United States Army Corps of Engineers or other Federal agency, or by a competent engineer or engineering firm, and (4) the district shall have entered into appropriate agreements with the United States of America or with its agencies or with the State of Mississippi or its agencies and political subdivisions, or with other states, meeting the requirements of cooperation for soil conservation projects or flood control and navigation projects or other water development projects, as authorized by law, then and in that event, the district, through its board of directors, shall have, in addition to and without limitation upon the

powers enumerated in Section 7 [5956-227], the additional powers hereinafter set out in this section. The term "project" when used herein shall mean the general plans and purposes of the Big Black River Basin District, including physical properties and the location of reservoir or reservoirs, dam or dams, and related facilities, as approved by the district and as recommended to be feasible and practicable as provided in the preceding sentence. Such approval by the district shall be by an affirmative vote of not less than seventy per cent (70%) of the full membership of its board of directors when directly related to and involving the mainstream of the Big Black River, and by an affirmative vote of not less than eighty per cent (80%) of the full membership of its board of directors when involving tributary streams. The words "project area" shall mean any geographic area, as defined by a resolution of the board of directors of the district, located within the district or without the district but within the watershed area of the Big Black River and its tributaries.

(a) To impound and appropriate for beneficial use overflow water and the surface water of the Big Black River or its tributaries within the project area at such place or places and in such amount as may be approved by the Board of Water Commissioners of the State of Mississippi, by the construction of a dam or dams, reservoir or reservoirs, work or works, plants and any other necessary related facilities contemplated and described as a part of the project, to control, store and preserve such waters, and to use, distribute, and sell the same; to construct or otherwise acquire within the project area, all works, plants, or other facilities necessary to the project for the purpose of soil conservation and/or for the purpose of processing such water and transporting it to cities and other facilities for domestic, municipal, commercial, industrial, agricultural and manufacturing purposes; and to control open channels for delivery purposes and water transportation.

(b) To acquire and develop any other available water necessary to the project and to construct, acquire, and develop all facilities within the project area deemed necessary with respect thereto, including terminals.

(c) To forest and reforest, and to aid in the foresting and reforesting of the project area, and to prevent and to aid in the prevention of soil erosion and flood within said area; to control, store and preserve within the boundaries of the project area the waters of the Big Black River or any of its tributaries, for irrigation of lands and for prevention of water pollution.

(d) To acquire by condemnation any and all property or interest in property of any kind, real, personal or mixed, within the Big Black River Basin, whether within or without the project area, strictly and presently necessary for the projects, according to the procedure provided by law for the condemnation of lands or other

property taken for rights-of-way or other purposes, by railroads, telephone or telegraph companies. For the purposes of this act the right of eminent domain of such district within the project area shall be superior and dominant to the right of eminent domain of railroad, telegraph, telephone, gas, power and other companies or corporations and shall be sufficient to enable the acquisition and relocation of county roads, State highways or other public property within the project area. The cost of right-of-way purchases, rerouting, and/or elevating all other county-maintained roads affected by construction shall be borne by the said water development district and new construction shall be of equal quality as in roads existing at the time of passage of this act. The county in which such work is done may assist in the above costs if the board of supervisors so desires.

The amount of and character of interest in land, other property and easements thus to be acquired shall be determined by the board of directors. Provided, however,

(1) In acquiring lands, either by negotiation or condemnation, the district shall not acquire minerals or royalties; sand and gravel shall not be considered as minerals within the meaning of this section; and

(2) No person or persons owning the drilling rights of the right to share in production shall be prevented from exploring, developing or producing oil or gas, with necessary rights-of-way for ingress and egress, pipelines and other means of transporting such projects by reason of the inclusion of such lands or mineral interests within the project area, whether below or above the waterline, but any such activities shall be under such reasonable regulations by the board of the directors as will adequately protect the project; and

(3) In drilling and developing, such persons be and are hereby vested with a special right to have such mineral interests integrated and their lands developed in such drilling unit or units as the State Oil and Gas Board shall establish after due consideration of the rights of all of the owners to be included in the drilling unit.

Provided further, that where any site or plot of land is to be rented, leased or sold to any person, firm or corporation for the purpose of operating recreational facilities thereon for profit, then the board shall, by resolution, specify reasonable terms and conditions of such sale, rental or lease, and shall advertise for public bids thereon. When such bids are received, the same shall be publicly opened by the board, and the board shall thereupon determine the highest and best bid submitted, and shall immediately notify the former owner of such site or plot of the amount, terms and conditions of such highest and best bid. Such former owner of such site or plot shall have the exclusive right at his option, for a period of thirty (30) days after written notice is received by the landowner

of the determination of the highest and best bid by the board, to rent, lease or purchase said site or plot of land, by meeting such highest and best bid, and by complying with all reasonable terms and conditions of such renting, leasing or sale, as specified by the board; provided, however, the board shall not in any event rent, lease or sell to any former owner more land than was taken from such former owner for the construction of the project, nor more than one-quarter mile of shoreline.

If such option is not exercised by such former owner within said period of thirty (30) days, the board shall accept the highest and best bid submitted.

(e) To require the necessary relocation of roads and highways, and railroad, telephone and telegraph lines, and properties, electric power lines, gas pipelines and mains and facilities in the project area or to require the anchoring or other protection of any of these, provided, due compensation is first paid the owners thereof, or agreement is had with such owners regarding the payment of the cost of such relocation. It is further provided that the district is hereby authorized to acquire easements or rights-of-way in or outside of the project area for the relocation of such roads, highways, railroad, telephone and telegraph lines and properties, electric power lines, gas pipelines and mains and facilities and to convey the same to the owners thereof in connection with such relocation as a part of the construction of the project; provided, however, the directors of the district shall not close any public access road to the project existing prior to the construction of the reservoir unless the board of supervisors of the county in which such road is located agrees thereto.

(f) To overflow and inundate any public lands and public property, including sixteenth section lands, and lieu lands within the project area.

(g) To construct, extend, improve, maintain and reconstruct, to cause to be constructed, extended, improved, maintained and reconstructed, and to use and operate, any and all facilities of any kind within the project area necessary to the project and to the exercise of such powers, rights, privileges and functions.

(h) To employ engineers, attorneys and all necessary agents and employees to properly finance, construct, operate and maintain the project and the plants and pay reasonable compensation for such services; for all services in connection with the issuance of bonds, the attorney's fee shall be in accordance with the following:

(1) On issues up to and including One Hundred Thousand Dollars (\$100,000.00), the attorney's fee shall not exceed one per cent (1%) thereof;

(2) On issues over One Hundred Thousand Dollars (\$100,000.00), and including Three Hundred Thousand Dollars (\$300,000.00) the attorney's fee shall not exceed one-half per cent ($\frac{1}{2}\%$) thereof:

(3) On issues over Three Hundred Thousand Dollars (\$300,000.00), the attorney's fee shall not exceed one-fourth per cent ($\frac{1}{4}\%$) thereof; but for any issue the attorney shall receive a minimum fee of Two Hundred Fifty Dollars (\$250.00). For any other services, reasonable compensation shall be paid. The board shall have the right to employ a general manager, who shall, at the discretion of the board, have the power to employ and discharge employees.

(i) To make such contracts in the issuance of bonds as may be necessary to insure the marketability thereof.

(j) To enter into contracts with municipalities, corporations, districts, public agencies or political subdivisions of any kind and others for any services, facilities or commodities which the project may provide. The district is also authorized to contract with any municipality, corporation or public agency for the rental, leasing, or purchase of, or for the operation of the water production, water filtration or purification, water supply and distributing facilities of such municipality, corporation or public agency upon such consideration as the district and such entity may agree. Any such contract may be upon such terms and for such time as the parties may agree, and it may provide that it shall continue in effect until bonds specified therein and refunding bonds issued in lieu of such bonds and all obligations are paid. Any such contract with any political subdivision shall be binding upon said political subdivisions according to its terms and such municipalities or other political subdivisions shall have the power to enter into such contracts, as in the discretion of the governing authorities thereof would be to the best interest of the people of such municipality or other political subdivision and such contracts may include within the discretion of such governing authorities a pledge of the full faith and credit of such political subdivisions for the performance thereof.

(k) To fix and collect charges and rates for any service, facilities, or commodities furnished by it in connection with said project and to impose penalties for failure to pay such charges and rates when due.

(l) To operate and maintain within the project area with the consent of the governing body of any city or town located within the district, any works, plants or facilities of any such city deemed necessary to the accomplishment of the purposes for which the district is created.

(m) Subject to the provisions of this act, from time to time to lease, sell or otherwise lawfully dispose of any property of any

kind, real, personal or mixed, or any interest therein, within the project area or acquired outside the project area as authorized in this act, for the purpose of furthering the purposes of the district.

(n) When, in the opinion of the board of directors as shown by resolution duly passed, it shall not be necessary to the carrying on of the business of the district that the district own any lands acquired, the board shall advertise such lands for sale to the highest and best bidder for cash, and shall receive and publicly open the bids thereon. The board shall, by resolution determine the highest and best bid submitted for such land, and shall thereupon notify the former owner, his heirs or devisees, by registered mail, of the land to be sold and the highest and best bid received therefor, and such former owner, or his heirs or devisees, shall have the exclusive right at his or their option for a period of thirty (30) days in which to meet such highest and best bid and to purchase said property.

(o) In the purchase of or entering into of all lease agreements for supplies, equipment, heavy equipment and the like, the directors shall in all instances comply with the provisions of the Public Purchase Act by public bids on such supplies and equipment.

SOURCES: Laws, 1964, ch. 249, par. 8.

CROSS REFERENCES: 5956-223, this title; Eminent Domain, 2749 et seq.; Public Purchases, 9027.

5956-229. Construction contracts.

All construction contracts by the district, where the amount of the contract shall exceed Two Thousand Five Hundred Dollars (\$2,500.00), shall be made upon at least three (3) weeks' public notice by advertisement in a newspaper of general circulation in the district, which notice shall state the thing to be done, and invite sealed proposals, to be filed with the secretary of the district, to do the work; and in all such cases, before the notice shall be published, the plans and specifications for the work shall be filed with the secretary of the district and there remain; and the board of directors of the district shall award the contract to the lowest and best bidder, who will comply with the terms imposed by such board, and enter into bond with sufficient sureties, to be approved by the board, in such penalty as shall be fixed by such board, but in no case to be less than the contract price, conditioned for the prompt, proper and efficient performance of the contract.

SOURCES: Laws, 1964, ch. 249, par. 9.

CROSS REFERENCES: Public Contracts 9014 et seq.

5956-230. Park and recreation facilities.

The Big Black River Basin District is authorized and empowered to establish or otherwise provide for public parks and recreation facilities and for the preservation of fish and wildlife and to acquire land otherwise than by condemnation for such purposes; provided, that this power shall not limit the power of condemnation provided in Section 7 (d) [5956-227(d)].

SOURCES: Laws, 1964, ch. 249, par. 10.

5956-231. Rules and regulations.

(a) The board of directors of the district shall have the power to adopt and promulgate all reasonable regulations so as to secure, maintain and preserve the sanitary condition of all water in and to flow into any reservoir owned by the district, to prevent waste of water or the unauthorized use thereof, and to regulate residence, hunting, fishing, boating, camping and circulation of vehicular traffic on land and the parking of such vehicles, and all recreational and business privileges in, along or around any such reservoir or any body of land, or easement owned by the district.

(b) All such regulations prescribed by the board of directors, after publication in a daily newspaper of statewide circulation and in a newspaper of general circulation in each county comprising the area of the district shall have the full force and effect of law, and violation thereof shall be punishable by fine not to exceed One Thousand Dollars (\$1,000.00), as may be prescribed in such regulations; or by imprisonment, not to exceed fifteen (15) days, or both the amount of the fine and the term of the imprisonment, within the maximum limit set by this statute and within the maximum limit prescribed in such regulations, to be determined by the court.

(c) In the event of a violation of any regulation adopted to prevent pollution of the waters in any reservoir owned by the district, or the threat of continuous violation thereof, the district shall have authority to sue for and obtain damages and/or other appropriate relief, including injunctive relief.

Provided, however, that all such rules and regulations so prescribed, and the penalties fixed thereunder, by the authority of this section, shall not conflict with, exceed, alter or suspend any regulations, rules or penalties prescribed by general statute, or by the Mississippi Game and Fish Commission, the Mississippi State Board of Health, or the Mississippi Boat Safety Committee; and all fines and penalties levied and collected under this act shall be remitted and accounted for in accordance with the general statutes relating thereto.

SOURCES: Laws, 1964, ch. 249, par. 11.

CROSS REFERENCES: Boats and Other Vessels 8496-01 et seq.; Game and Fish 5841 et seq.; Health Quarantine 7024 et seq.

5956-232. Depository for funds of district.

(a) The board of directors shall designate one or more banks within the district to serve as depositories for the funds of the district, and all funds of the district other than funds required by any trust agreement to be deposited, from time to time, with the trustee or any paying agent for outstanding bonds of the district, shall be deposited in such depository bank or banks.

(b) Before designating a depository bank or banks, the board of directors shall issue a notice stating the time and place the board will meet for such purpose and inviting the banks in the district to submit applications to be designated depositories. The term of service for depositories shall be prescribed by the board. Such notice shall be published one (1) time in a newspaper or newspapers published in the district and specified by the board.

(c) At the time mentioned in the notice, the board shall consider the applications and the management and conditions of the banks which offer the most favorable terms and conditions for the handling of the funds of the district and which the board finds have proper management and are in condition to warrant handling of district funds, and are in the manner as provided under the chapter on depositories. Membership on the board of directors of an officer or director of a bank shall not disqualify such bank from being designated as a depository.

(d) If no applications acceptable to the board are received by the time stated in the notice, the board shall designate some bank or banks within the district upon such terms and conditions as it may find advantageous to the district.

SOURCES: Laws, 1964, ch. 249, par. 12.

5956-233. Agreements with the United States relative to Federal Highways.

The Board of Directors of the Big Black River Basin District is hereby authorized and empowered to negotiate and contract with the United States of America, or any agency thereof, concerning all lands, easements and rights-of-way necessary for the relocation of any Federal road, highway or parkway or for the facilities appurtenant thereto.

SOURCES: Laws, 1964, ch. 249, par. 13.

5956-234. Cooperation with other governmental agencies.

The Big Black River Basin District shall have authority to act jointly with political subdivisions and agencies, and commissions and instrumentalities of this State or any other state, and with the Federal Government and agencies thereof, in the performance of the

purposes and services authorized in this act, upon such terms as may be agreed upon by the directors. The board of directors of the district shall have the authority to negotiate and contract with the Secretary of the Army under the provisions of any applicable law or regulation written pursuant thereto.

SOURCES: Laws, 1964, ch. 249, par. 14.

5956-235. District and its bonds exempt from taxation.

The accomplishment of the purposes stated in this act being for the benefit of the people of this State and for the improvement of the properties and industries, the district in carrying out the purposes of this act will be performing an essential public function and shall not be required to pay any tax or assessment on the projects and related facilities or any part thereof, and the interest on the bonds issued hereunder shall at all times be free from taxation within this State; and the State hereby covenants with the holders of any bonds to be issued hereunder that the Big Black River Basin District shall not be required to pay any taxes or assessments imposed by the State or any of its political subdivisions or taxing districts.

SOURCES: Laws, 1964, ch. 249, par. 15.

5956-236. Overflow of school lands not to constitute waste.

It is hereby declared as a matter of legislative determination that the necessary overflow and inundation of sixteenth section lands or lieu lands shall not constitute legal waste of such lands. The district shall pay a reasonable rental for the use of such lands to be overflowed, and the damages thereof to be determined by the chancery court of the county in which the land is located. Provided further, that any sixteenth section lands that have been flooded shall be reforested before this project shall ever be abandoned.

SOURCES: Laws, 1964, ch. 249, par. 16.

5956-237. Saving clause.

Nothing in this act shall be construed to violate any provision of the Federal or State Constitutions, and all acts done under this act shall be done in such manner as will conform thereto, whether herein expressly provided or not. Where any procedure hereunder may be held by any court to be violative of either of such Constitutions, the district shall have the power by resolution to provide an alternative procedure conformable with such Constitutions. If any provision of this act shall be invalid, such fact shall not affect the creation of the district or the validity of any other provision of this act, and the Legislature here declares that it would have created the district and enacted the valid provisions of this act, notwithstanding the invalidity of any other provisions thereof.

SOURCES: Laws, 1964, ch. 249, par. 17.

5956-238. Effective date.

This act shall take effect and be in force from and after its passage (approved June 1, 1964).

SOURCES: Laws, 1964, ch. 249, par. 18.

EXHIBIT B
MISSISSIPPI WATER RIGHTS ACT

WATER RIGHTS LAW OF MISSISSIPPI

The following section numbers refer to sections as designated in Mississippi Code of 1942, Recom, piled. The original act was passed as House Bill 232, 1956 Regular Session, signed by the Governor on April 6, 1956. House Bill 556, 1958 Regular Session and Senate Bill 1717, 1966 Regular Session added a few amendments that are included in the complete act below.

Sections

- 5956-01 Conservation of water resources in state
- 5956-02 Definitions
- 5956-03 Construction
- 5956-04 Water rights defined
- 5956-05 Water appropriation equal to other property rights
- 5956-06 Termination of water rights
- 5956-07 Application for appropriation of water
- 5956-08 Board of Water Commissioners, created.
- 5956-09 Organization of board-compensation and expenses
- 5956-10 Water engineer
- 5956-11 Co operation of board with other agencies.
- 5956-12 Inventory of water resources
- 5956-13 Powers and duties of board
- 5956-14 Water districts
- 5956-15 Unappropriated waters
- 5956-16 Application for permit to acquire appropriate rights
- 5956-17 Duty of board as to application-maps, plats, etc.
- 5956-18 Approval of application.
- 5956-19 Issuance of license
- 5956-20 Construction of dams and reservoirs
- 5956-21 Compacts and agreements
- 5956-22 Surveys
- 5956-23 Diversion of water course
- 5956-24 Water rights adjudicated by court
- 5956-25 Appeal from acts of board
- 5956-26 Power of board at hearings
- 5956-27 Report to legislature
- 5956-28 Severability
- 5956-29 Laws repealed
- 5956-30 Effective date

Sec. 5956-01. Conservation of Water resources in state.

(a) **Declaration of Policy:** It is hereby declared that the general welfare of the people of the State of Mississippi requires that the water resources of the state be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use, or unreasonable method of use, of water be prevented, and that the conservation of such water be exercised with the view to the reasonable and beneficial use thereof in the interest of the people, and that the public and private funds for the promotion and expansion of the beneficial use of water resources shall be invested to the end that the best interests and welfare of the people is served

(b) Water occurring in any watercourse, lake or other natural water body of the state, is hereby declared to be public waters and public wealth of the state, and subject to appropriation in accordance with the provisions of this act, and the control and development and use of water for all beneficial purposes shall be in the state, which, in the exercise of its police powers, shall take such measures as shall effectuate full utilization and protection of the water resources of Mississippi

(c) Nothing in this act shall be construed or interpreted as affecting ground or subterranean water rights or usage.

Sec. 5956-02. Definitions.

The words and phrases when used in this Act shall, for the purposes of this Act, have the meanings respectively ascribed to them in this section, except in those instances where the context clearly indicates a different meaning.

(a) **"Person"** - Every natural person, firm, partnership, association, cooperative, public and private corporations, irrigation or other improvement district and any state or federal agency.

(b) **"Surface Water"** - That water occurring on the surface of the ground, and **"Ground Water"** - That water occurring beneath the surface of the ground.

(c) **"Domestic Uses"** - The use of water for ordinary household purposes, the watering of farm livestock, poultry and domestic animals and the irrigation of home gardens and lawns.

(d) **"Municipal Use"** - The use of water by a municipal government and the inhabitants thereof, primarily to promote the life, safety, health, comfort and business pursuits of the inhabitants. It does not include the irrigation of crops, although within the corporate boundaries.

(e) **"Beneficial Use"** - The application of water to a useful purpose that inures to the benefit of the water user and subject to his dominion and control but does not include the waste of water.

(f) **"Appropriator"** - The person who obtains a permit from the Board authorizing him to take possession by diversion or otherwise and to use and apply an allotted quantity of water for a designated beneficial use, and who makes actual use of the water for such purpose

(g) "Appropriation" -

(1) The use of a specific amount of water at a specific time and at a specific place, authorized and allotted by the board for a designated beneficial purpose within the specific limits as to quantity, time, place and rate of diversion and withdrawal

(2) The right to continue the use of water having actually been applied to any beneficial use at the time of the effective date of this Act, or within three (3) years prior thereto to the extent of the beneficial use made thereof. Provided, that it is not the intent of this Act that any person making use of any watercourse for waste disposal or in pollution abatement, on the effective date of this Act, shall be construed as having any vested right to pollute the waters of the watercourse

(3) The right to take and use water for beneficial purposes where a person is bona fide engaged in the construction of works for the actual application of water to a beneficial use at the time of the effective date of this Act, provided such works shall be completed and water is actually applied for such use within three (3) years after this Act becomes effective, with extension of not more than seven (7) years in the discretion of the board. It is not the intent, however, to validate any claim to the use of water, or for rights of construction looking to the use of water, not lawful on the effective date of this Act

(h) "Watercourse" - Any natural lake, river, creek, cut or other natural body of fresh water or channel having definite banks and bed with visible evidence of the flow or occurrence of water, except such lakes without outlet to which only one landowner is riparian

(i) "Established average minimum flow" - When reasonably required for the purpose of this Act, the Board shall determine and establish the average minimum flow for a given stream at a given point thereon. The "average minimum flow" as used in this Act shall be the average of the minimum daily flow occurring during each of the five (5) lowest years in the period of the preceding twenty (20) consecutive years. Such determinations shall be based upon available stream-flow data, supplemented, when available data is incomplete, by reasonable calculations

(j) "Established average minimum lake levels" - When reasonably required for the purpose of this Act, the Board shall determine and establish the average minimum lake levels for a given lake. The "average minimum lake level," as used in this Act, shall be the average of the minimum lake level during each of the five (5) lowest years in the period of the preceding twenty (20) consecutive years. Such determination shall be based upon the best available data, supplemented, when data is incomplete, by reasonable calculations

(k) "Board" - The Board of Water Commissioners of the State of Mississippi

(l) "Water Engineer" - The water engineer of the Board of Water Commissioners of the State of Mississippi

Sec. 5956-03 Construction.

Nothing in this act shall be construed as making same applicable to dredging or washing of sand and gravel.

Sec. 5956-04. Water rights defined

(a) After April 1, 1958, no right to appropriate or use water subject to appropriation shall be initiated or acquired except upon compliance with the provisions of this act, and no person shall take water from a stream, lake or other watercourse without having a valid right to do so. Provided, however, that any person or persons claiming their rights under Section 2 (g)(2), Chapter 167, Laws of 1956 (5956-02), where that person had begun to make beneficial use of water at the time of the effective date of Chapter 167, Laws of 1956 (5956-01 et seq.), which was April 6, 1956, or within three (3) years prior thereto, or after April 6, 1956, until December 31, 1958, shall file their claim with the Board of Water Commissioners on or before December 31, 1958 and after said date of December 31, 1958, claims may be filed with the board, but the priority of all claims will be determined by the date the claim is received by the board. Any person convicted of violating the provisions hereof shall be fined not to exceed One Hundred Dollars (\$100.00), or be imprisoned not to exceed thirty (30) days, or both, in the discretion of the court, provided, however, nothing herein shall interfere with the customary use of water for domestic purposes, and the user of water for domestic purposes may elect to establish a right to the use of such water under the procedures provided in this act; and provided, further, that nothing herein shall operate to deprive any landowner of the right to the use of the water from a spring arising on his land so long as such use does not interfere with the right of any water user below; and provided, further, that nothing herein shall interfere with a landowner's right to place a dam across a gully on his property or across a stream that originates on his property so long as provision is made for continued established average minimum stream flow, if and when such flow is required to protect the rights of water users below

(b) Subject to the common law, or other lawful water rights of others, any person may build and maintain a dam on any stream having a minimum flow of not more than one half million gallons of water per day and utilize up to three hundred (300) acre feet of the impounded water without a permit from the board so long as such action does not affect the established average minimum flow in the stream below the dam, and provided, however, that any such person who seeks to build and maintain a dam on such stream within the territorial limits of any watercourse lying in whole or in part within a levee district duly constituted under the laws of this state shall first obtain permission from the levee board of such levee district

(c) The board shall have the authority to permit the appropriation of water of any stream only in excess of the established average minimum flow as based upon records of computations by the board, provided, however, exceptions may be made for domestic and municipal users, and provided, further, that the board may authorize any appropriator to use the established minimum flow upon written assurance that such water will be immediately returned to the stream in substantially the same amount to insure the maintenance at all times of the average minimum flow. Provided, further, that the board may authorize an appropriator to use the established minimum flow for industrial purposes when such water shall be returned within such reasonable time, as specified by the board in its authorization, to the stream at a point downstream from the place of withdrawal, where the board shall find that such appropriation will not result in any substantial detriment to property owners affected thereby or to the public interest

(d) The board shall have the authority to permit the appropriation of water of any lake only in excess of the established average minimum lake level as based upon records or computations by the board; provided, however, exceptions may be made for domestic and municipal users, and provided, further, that the board, upon affording a hearing to interested parties, may authorize any appropriator to use below the established average minimum level when such use will not affect plans for the proper utilization of the water resources of the state, or the board may establish a level above the established average minimum lake level, after affording an opportunity for a hearing, where plans for the proper utilization of the water resources of the state require it.

(e) No appropriation of water shall be authorized that will impair the effect of stream standards set under the pollution control laws of this state based upon a minimum average stream flow.

(f) No appropriation of water shall be authorized or continued that will impair the navigability of any navigable watercourse. A determination of impairment by the Corps of Engineers of the United States Army shall constitute prima facie evidence of such impairment.

Sec. 5956-05 Water appropriation equal to other property rights

No water appropriation acquired pursuant to law shall be declared forfeited and surrendered except by a court of competent jurisdiction as other property rights are determined. Provided, however, upon good cause shown, the board may modify or terminate any appropriation at any time.

Sec. 5956-06 Termination of water rights.

The right of the appropriator and his successors to the use of water shall terminate when he ceases for three (3) consecutive years to use it for the specific beneficial purpose authorized in his permit or license; provided, however, that upon his application prior to the expiration of said three (3) year period for extension of said permit or license, the board may grant such extension without the loss of priority.

Sec. 5956-07 Application for appropriation of water

Appropriation of surface waters of the state shall not constitute absolute ownership or absolute rights of use of such waters, but such waters shall remain subject to the principle of beneficial use. It shall be the duty of the board to approve all applications made in such form as shall meet the requirements of this act and such rules and regulations as shall be promulgated by the board, and which contemplate the utilization of water for beneficial purposes, within reasonable limitations, provided, the proposed use does not prejudicially and unreasonably affect the public interest. If it is determined that the proposed use of the water sought to be appropriated is not for beneficial purposes, is not within reasonable limitations, or be detrimental to the public interest, it shall be the duty of the board to enter an order rejecting such application or requiring its modification.

Sec. 5956-08. Board of Water Commissioners, created

For the administration of this Act there is hereby created a Board of Water Commissioners of the State of Mississippi, consisting of seven (7) members appointed by the governor, by and with the advice and consent of the Senate, whose terms of office shall be for a period of four (4) years as follows: One from each of the congressional districts as now constituted, and one from the state at large. At all times the membership of said board shall have represented on it at least one member well versed in each of the major types of water users in the state as follows: recreational, industrial, municipal, and agricultural. The chairman shall be elected by the members of the board. Upon the expiration of the term of office of the present members of said board, their successors shall be appointed in the following manner: Each member selected from each of the six present congressional districts, shall serve for the same number of years as the number of the congressional district from which he is selected and the member selected from the state at-large shall serve for seven years and the successors to each of these members shall serve for seven years.

Sec. 5956-09. Organization of board—compensation and expenses

The governor shall call a meeting of the board within thirty (30) days after its appointment. At such first meeting the board shall elect one of its members as chairman and one as a secretary. Each member of the board shall receive fifteen dollars (\$15.00) per day, not to exceed sixty (60) days in any fiscal year, and actual traveling expenses while in the performance of the duties for which appointed, and such sums shall be paid from the general fund of the state.

Sec. 5956-10. Water engineer

The board is authorized to employ a water engineer and such other personnel as may be necessary, all of whom shall serve during the pleasure of the board, at such salaries as shall be fixed by the board. The water engineer may act as executive officer and advisor to the board in all matters pertaining to the distribution and conservation of surface waters of the state as provided by this act. The person appointed as water engineer shall be a licensed engineer, trained in hydraulics and hydrology, qualified by experience, knowledge and personality to serve as required by the board and to represent it whenever required.

Sec. 5956-11 Co-operation of board with other agencies.

- (a) The board shall co-operate with all persons and agencies interested in regulating and conserving the use of water.
- (b) The board shall establish such units of measurement as are necessary in the administration of this act.

Sec. 5956-12 Inventory of water resources

As soon as practicable, the board shall inventory the water resources of the state and gather such adequate data as may be helpful in the administration of this act. The board may co-operate with any agency of the federal or state governments in accumulating such data.

Sec. 5956-13 Powers and duties of board.

- (a) The board shall make such observations and measurements as will enable it to administratively determine and

establish the rights of all water users who, on the effective date of this act, are making beneficial use of water, and shall afford such water users an opportunity to be heard

(b) Such administrative determination of rights, as provided for in this section, shall be made the subject of a written order, the original of which shall be furnished the person concerned. Such observations and measurements as were made shall be reduced to writing and filed with a copy of the order of determination certified to by the chairman of the board, in the office of the clerk of the chancery court in the county in which the point of diversion exists.

(c) Service of notice shall be deemed completed upon depositing the notice in the post office, as registered mail, addressed to the person concerned at his last known post office address. The order of determination of the board shall be in full force and effect from the date of its entry in the records of the office of the clerk of the chancery court until its operation shall be stayed by an order of a court of competent jurisdiction.

Sec. 5956-14. Water districts.

The board shall divide the state into water districts with reference to water resources, however, no district shall be created until a necessity therefor exists.

Sec. 5956-15. Unappropriated waters.

The following are hereby declared to constitute unappropriated waters: (a) All water which has never been appropriated; (b) All water heretofore appropriated which has not been in process, from the date of the initial act of appropriation, with a fee of three dollars (\$3 00) accompanying such application. The application shall set forth, (a) the name and post office address of the applicant, (b) the source of water from which the appropriation shall be made, (c) the amount of water sought, in standard units of measurement, (d) the location of the proposed works for the diversion and use of the water, including such maps or plats as may be necessary for positive identification, (e) the estimated time for the completion of the works; (f) the estimated time for the first actual application of the water for the beneficial use proposed; (g) if for irrigation use, a description of the land to be irrigated by designating the number of irrigable acres, and its relative location with respect to the source of the water supply, (h) if for municipal water supply, or the supply of an adjacent area to be served by the municipality, it shall give the present population to be served, and the estimated future requirements of the city, not to exceed twenty (20) years; said twenty (20) years' estimate of future requirements to be based on the same rate increase of population as that had in the twenty (20) year period, or such fraction thereof as required, immediately preceding the estimate, unless an unusual situation shall be shown to the board to exist, or is foreseen which would justify a deviation from the twenty (20) year rule; (i) Any additional factors which may be required by the board.

Sec. 5956-16. Application for permit to acquire appropriate rights.

Any person intending to acquire an appropriate right to any of the surface streams, lakes and other water-courses of the state for beneficial use, may do so only by making application to the board for a permit to make such appropriation, with a fee of three dollars (\$3 00) accompanying such application. The application shall set forth, (a) the name and post office address of the applicant, (b) the source of water from which the appropriation shall be made, (c) the amount of water sought, in standard units of measurement, (d) the location of the proposed works for the diversion and use of the water, including such maps or plats as may be necessary for positive identification, (e) the estimated time for the completion of the works; (f) the estimated time for the first actual application of the water for the beneficial use proposed; (g) if for irrigation use, a description of the land to be irrigated by designating the number of irrigable acres, and its relative location with respect to the source of the water supply, (h) if for municipal water supply, or the supply of an adjacent area to be served by the municipality, it shall give the present population to be served, and the estimated future requirements of the city, not to exceed twenty (20) years; said twenty (20) years' estimate of future requirements to be based on the same rate increase of population as that had in the twenty (20) year period, or such fraction thereof as required, immediately preceding the estimate, unless an unusual situation shall be shown to the board to exist, or is foreseen which would justify a deviation from the twenty (20) year rule; (i) Any additional factors which may be required by the board.

All fees received by the board as herein prescribed shall be deposited in the general fund of the state.

Sec. 5956-17. Duty of board as to application—maps plats, etc.

(a) Upon receipt of the application it shall be the duty of the board to have endorsed thereon the date of the receipt and assign it a number. If upon examination the application is found to be defective, inadequate or insufficient to enable the board to determine the place, nature and amount of the proposed appropriation, it shall be returned for correction or completion or for other required information. No application shall lose its priority of filing on account of such defects, provided acceptable data, proof, maps, plats, plans, and drawings are filed in the office of the board within thirty (30) days following the date of the posting of the return of such application or such further time, not exceeding one year, as may be given by the board.

(b) All maps, plats, plans and drawing shall conform to prescribed uniform standards as to materials, size, coloring and scale as prescribed by the board, and shall show: (a) the source from which the proposed appropriation is to be taken; (b) all proposed dams, dikes, reservoirs, canals, pipe lines, power houses and other structures for the purpose of storing, conveying or using water for the purpose approved and their positions or courses in connection with the boundary lines and corners of the lands which they occupy. Land listed for irrigation shall be shown in acres. Default in the refiling of any application within the time limit specified shall constitute a forfeiture of priority date and the dismissal of the application. All maps, plats, plans, drawings and applications submitted shall become the property of the board.

Sec. 5956-18. Approval of application.

(a) Upon approval of the application the board shall notify the applicant to that effect and issue a permit authorizing him to proceed with the construction of the proposed diversion works and to take all steps required to apply the water to the approved and proposed beneficial use, and otherwise perfect his proposed appropriation. An application may be approved for a less amount of water than that requested if, in the opinion of the board, the approval of the full amount requested would interfere with a vested right or is against public interest. An applicant shall be entitled to proceed with construction of diversion works and with the diversion and use of water in accordance with the approval and such limitations as may be prescribed by the board. Provided, however, that no application shall be approved until the substance thereof shall have been published by the applicant in a newspaper having general circulation in the county wherein the point of diversion exists, at least ten (10) days before approval of such application, and a public hearing accorded any person whose rights may be adversely affected by such approval. At such hearing all persons concerned will be accorded the right of counsel and the right to introduce evidence in their behalf.

(b) If the application is refused the board shall so notify the applicant, and it shall be unlawful for such applicant to take any steps toward the construction of the proposed diversion works or to divert or use any such water, so long as the refusal shall continue in force. Any person who proceeds subsequent to the effective date of this act to construct and maintain diversion works without the approval of the board being first obtained, may be enjoined in any court of competent jurisdiction. The board shall limit the time for the perfecting of an appropriation to a reasonable period with which the proposed works can be completed by due diligence taking into consideration the size, complexity and cost of the work, and seasonal conditions, and may for good cause shown by the applicant allow an extension of time.

Sec. 5956-19. Issuance of license.

Within sixty (60) days after the completion of the construction of the works and the actual application of water to the proposed beneficial use within the time allowed, the permittee shall so notify the board. The board shall then examine and inspect the appropriation diversion works and, if it is determined that such works have been completed and the appropriation right perfected in conformity with the approved application and plans, the board shall issue a license in duplicate. The original of such license shall be sent to the licensee and shall be recorded in the office of the clerk of the chancery court in the county wherein the point of diversion is located as other instruments affecting real estate, and the duplicate shall be made a matter of record in the office of the board. The fee for filing the license in the office of the clerk of the chancery court shall be one dollar (\$1.00), to be paid by the applicant.

Sec. 5956-20. Construction of dams and reservoirs.

Any person desiring to build a dam or reservoir on any watercourse as herein defined, except as provided in section 4 (Sec. 5956-04) before proceeding with the construction thereof, must obtain a written statement from the board that such construction will not affect plans for the proper utilization of the water resources of the state, provided, however, any such petition which seeks authorization of any program of works to be performed within the territorial limits of any watercourse lying in whole or in part within a levee district duly constituted under the laws of this state shall include a copy of a resolution adopted by the levee board of such levee district approving all relief sought under the petition, and any individual violating the provisions of this section may be enjoined therefrom.

Sec. 5956-21. Compacts and agreements.

The board shall have authority to enter into compacts and agreements concerning this state's share of waters flowing in watercourses where a portion of such waters are contained within the territorial limits of a neighboring state.

Sec. 5956-22. Surveys.

Any member of the board or any person authorized by it, shall have the right to enter upon private, county or state lands for the purpose of making surveys and examinations necessary in the gathering of facts concerning streams and natural watersheds, subject to responsibility for any damage done to property entered.

Sec. 5956-23. Diversion of water course

(a) The board may consider, approve, modify at the request of the applicant, or reject applications for permanent or temporary changes in the place of diversion or use of water from those originally appropriated or approved, subject to the rules and regulations of the board and following the procedure herein established for original application for appropriation.

(b) Any person who changes or attempts to change the point or place of diversion or use of water, either permanently or temporarily, without first applying to the board in the manner prescribed, shall obtain no right thereby and shall be guilty of a misdemeanor, and punished therefor in the discretion of the court, not to exceed a fine of two hundred dollars (\$200.00). Each day of such unlawful change shall constitute a separate offense, separately punishable.

(c) Each application for a temporary or permanent change shall be accompanied by a fee of one dollar (\$1.00). All fees received by the board as herein prescribed shall be deposited in the general fund of the state.

Sec. 5956-24. Water rights adjudicated by court

Whenever the rights for the use of waters within the state shall have been adjudicated by any court, the board shall aid in the distribution of water in accordance with the terms of the decree, and it shall be the duty of the clerk of any court in which such decree has been issued, with ten (10) days after such decree shall have been entered, to forward to the board of water commissioners, by registered mail, a certified copy of the decree.

Sec. 5956-25. Appeal from acts of board.

(a) Any order, decision or other official act of the board in administering the provisions of this act, may be appealed by any person aggrieved thereby to the circuit court of the county wherein the point of diversion exists by serving the chairman or someone of discretion at the office of the board, within sixty (60) days after receipt of written notice of the order, decision or official act, notice of appeal stating the grounds upon which the appeal is founded. The appeal may be based on legal or factual grounds or both. After proper hearing, at which testimony may be offered for any aggrieved person, the court may sustain, reverse or modify the order of the board which may be appealed to the supreme court the same as other orders of the circuit court. The attorney general, or his representative, shall represent the board on all appeal matters. The board shall, within thirty (30) days after service of the notice of appeal, make a return to the circuit court, giving copies of all documents and orders and a transcript of the testimony taken.

(b) Within fifteen (15) days after the service of the notice of appeal, the board may serve upon the appellant an offer in writing to correct the order from which appealed in any of the particulars mentioned in the notice of appeal. The appellant may thereupon, and within fifteen (15) days thereafter, file with the board a written acceptance of such offer, and in such cases the board shall thereupon make a minute of such acceptance in its permanent files and correct the order accordingly, and the same, so corrected, shall stand as the order of the board and shall be filed in the office of the clerk of the circuit court.

Sec 5956-26 Power of board at hearings

At any hearing or other proceeding authorized by this act, the board shall have power to administer oaths, to take testimony, to issue subpoenas and compel the attendance of witnesses, which shall be served in the same manner as subpoenas issued by the courts of the state and to order the taking of depositions in the same manner as depositions are taken in the courts.

Sec 5956-27 Report to legislature

The board shall report fully to the legislature within ten (10) days after convening date of each regular session on its work during the biennium.

Sec 5956-28 Severability

If for any reason any section, provision, item, phrase, clause, sentence, or part of any section of this act shall be held unconstitutional, the invalidity of such section, provision, item, phrase, clause, sentence, or part of section shall not affect the validity of the remainder of the act but such remainder shall be permitted to stand and the various provisions of this act are hereby declared to be separable for that purpose.

Sec. 5956-29 Laws repealed

All acts or part of acts inconsistent herewith are hereby repealed.

Sec 5956-30 Effective date

Except as provided in section 4 (Sec. 5956-04) herein, this act shall take effect and be in force from and after passage.
(Approved April 6, 1956)

EXHIBIT C

MISSISSIPPI AIR AND WATER
POLLUTION CONTROL ACT

MISSISSIPPI AIR & WATER POLLUTION CONTROL COMMISSION
416 North State Street - Suite 3
P. O. Box 827
Jackson, Mississippi 39205

MISSISSIPPI CODE OF 1942 - SECTION 7106 111-136
MISSISSIPPI LAWS OF 1966 - CHAPTER 258
SENATE BILL NO. 1955

AN ACT TO ESTABLISH A STATE AIR AND WATER POLLUTION CONTROL COMMISSION; TO AUTHORIZE THE CONTROL, PREVENTION AND ABATEMENT OF POLLUTION OF THE AIR AND THE SURFACE AND UNDERGROUND WATERS OF THE STATE OF MISSISSIPPI; TO DESIGNATE THE MEMBERSHIP OF THIS COMMISSION; TO PROVIDE FOR ITS DUTIES, POWERS, AND RESPONSIBILITIES; AND FOR RELATED PURPOSES.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MISSISSIPPI:

SECTION 1. Statement of policy. Whereas, the pollution of the air and waters of the State constitutes a menace to public health and welfare, creates a public nuisance, is harmful to wildlife, fish and aquatic life, and impairs domestic, agricultural, industrial, recreational and other legitimate beneficial uses of air and water, and whereas, the problem of air and water pollution in this State is closely related to the problem of air and water pollution in adjoining states, it is hereby declared to be the public policy of this State to conserve the air and waters of the State and to protect, maintain and improve the quality thereof for public use, for the propagation of wildlife, fish and aquatic life, and for domestic, agricultural, industrial, recreational and other legitimate beneficial uses; to maintain such a reasonable degree of quality of the air resources of the State to protect the health, general welfare and physical property of the people, and to provide that no waste be discharged into any waters of the State without first receiving the necessary treatment or other corrective action to protect the legitimate beneficial uses of such waters; to provide for the prevention, abatement and control of new or existing air or water pollution; and to cooperate with other agencies of the State, agencies of other states, and the Federal Government in carrying out these objectives.

SECTION 2. Definitions. For the purposes of this act, the following words and phrases shall have the meanings ascribed to them in this section:

Subdivision 1. Water.

(a) "Pollution" means such contamination, or other alteration of the physical, chemical or biological properties, of any waters of the State, including change in temperature, taste, color, turbidity, or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive, or other substance into any waters of the State as will,

or is likely to, create a nuisance or render such waters harmful, detrimental or injurious to public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish or other aquatic life.

(b) "Wastes" means sewage, industrial wastes, oil field wastes, and all other liquid, gaseous, solid, radioactive, or other substances which may pollute or tend to pollute any waters of the State.

(c) "Sewerage system" means pipelines or conduits, pumping stations, and force mains, and other structures, devices, appurtenances and facilities used for collecting or conducting wastes to an ultimate point for treatment or disposal.

(d) "Treatment works" means any plant or other works, used for the purpose of treating, stabilizing or holding wastes.

(e) "Disposal system" means a system for disposing of wastes, either by surface or underground methods, and includes sewerage systems, treatment works, disposal wells, and other systems.

(f) "Waters of the State" means all waters within the jurisdiction of this State, including all streams, lakes, ponds, impounding reservoirs, marshes, watercourses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, situated wholly or partly within or bordering upon the State, and such coastal waters as are within the jurisdiction of the State, except lakes, ponds, or other surface waters which are wholly landlocked and privately owned.

Subdivision 2. Air.

(a) "Air contaminant" means particulate matter, dust, fumes, gas, mist, smoke, or vapor or any combination thereof produced by processes other than natural.

(b) "Air pollution" means the presence in the outdoor atmosphere of one or more air contaminants in quantities, of characteristic, and of a duration which are materially injurious or can be reasonably expected to become materially injurious to human, plant or animal life or to property or which unreasonably interfere with enjoyment of life or use of property, throughout the State or throughout such area of the State as shall be affected thereby.

(c) "Air contamination" means the presence in the outdoor atmosphere of one or more air contaminants which contribute to a condition of air pollution.

(d) "Air contamination source" means any source at, from, or by reason of which there is emitted into the atmosphere any air contaminant, regardless of who the person may be who owns or operates the building, premises or other property in, at, or on which such source is located, or the facility, equipment or other property by which the emission is caused or from which the emission comes.

(e) "Air-cleaning device" means any method, process or equipment which removes, reduces or renders less noxious air contaminants discharged into the atmosphere.

(f) "Area of the State" means any city or county or portion thereof or other substantial geographical area of the State as may be designated by the Mississippi Air and Water Pollution Control Commission.

Subdivision 3. General.

(a) "Commission" means the Mississippi Air and Water Pollution Control Commission.

(b) "Person" means the State or other agency or institution thereof, any municipality, political subdivision, public or private corporation, individual, partnership, association, or other entity, and includes any officer or governing or managing body of any municipality, political subdivision, or public or private corporation.

SECTION 3. Creation and organization of the Commission. (a) There is hereby created and established the Mississippi Air and Water Pollution Control Commission, which shall be composed of the following members: the Director of the Division of Sanitary Engineering of the State Board of Health; the Director of the State Game and Fish Commission; the Water Engineer of the State Board of Water Commissioners; the Supervisor of the State Oil and Gas Board; the Director of the State Plant Board; the Executive Secretary of the State Marine Conservation Commission; and four (4) members to be appointed by the Governor, with the advice and consent of the Senate, one (1) of whom shall represent municipalities and shall be an elected official of a municipality of the State; two (2) of whom shall represent industry but shall not come from the same basic industry; and one (1) of whom shall be appointed by the Governor from a list of the names of ten (10) persons to be submitted by the Mississippi Wildlife Federation. The term of the office of the appointed members shall be six (6) years, except for the first terms, which shall be two (2), four (4), five (5) and six (6) years, respectively, or until their successors are appointed and qualified. Vacancies which occur shall be filled in the same manner as the original appointments were made. The Commission shall carry out the functions and duties conferred on it by this act.

(b) There shall be the following associate members of the Commission, who shall have the right to meet with the Commission at any time and shall be subject to the call of the Commission at all times, and who shall have the right of full discussion in matters pending before the Commission, but who shall have no vote thereon: the Director of the Agricultural and Industrial Board; the State Geologist; the Director of State Parks. Any one or all of the aforesaid associate members shall have the right to designate in writing some other official or person employed by the respective organization to represent the person designated herein as an associate member.

(c) Each State agency member of the Commission may, by official order filed with the Executive Secretary of the Commission, designate

a representative of his department to perform the duties of the member making the designation. Such person, if any, so designated, shall have the powers and be subject to the duties and responsibilities of the officer appointing him.

(d) The State agency members and associate members of the Commission shall receive no additional salary or per diem for their services as members of the Commission, but shall be allowed their travel and maintenance expenses while on official business of the Commission away from Jackson as provided by law. The members appointed by the Governor shall be allowed Twenty Dollars (\$20.00) per day plus their travel and maintenance expenses while attending regular and special meetings, or on other official business of the Commission, to be paid out of funds appropriated to the Commission.

SECTION 4. Meetings. Within ten (10) days after their appointment, the members of the Commission shall meet in Jackson and organize, electing one (1) of the members Chairman and one (1) Vice-Chairman, and both shall serve for a term of two (2) years. The Commission shall be assigned suitable and necessary office space and provided such furnishings as necessary to carry on its work. The Commission shall hold regular monthly meetings in the principal offices of the Commission in the City of Jackson, Mississippi, on the third Tuesday of each month for the first three (3) months after this act goes into effect, and thereafter it shall hold its regular meetings quarterly on the third Tuesday of January, April, July, and October, provided that upon call of the Chairman, or the Vice-Chairman in the absence from the State or the disability of the Chairman, said Commission may hold special meetings and open hearings at any place in the State of Mississippi, but the Secretary of the Commission shall give reasonable written notice of such special meeting or hearing, stating the hour, date, place, and purpose of such meeting, such written notice to be delivered to the office of each member and associate member of the Commission and Executive Secretary thereof at least forty-eight (48) hours prior to the meeting; provided further, that the Chairman or Vice-Chairman of the Commission must call such special meeting upon receipt of a written request therefor filed by two (2) or more members of the Commission with written notice to be given as herein provided. A majority of the members of the Commission shall constitute a quorum.

SECTION 5. Administrative employees. (a) At its first regular meeting after organization, or as soon thereafter as practical, the Commission shall appoint an Executive Secretary who shall be a person fully trained and experienced in pollution control. The Executive Secretary shall continue in office at the pleasure of the Commission and his salary shall be fixed by the Commission, to be payable monthly, and he shall have reimbursed to him all actual and necessary expenses incurred in carrying out his official duties while away from home, upon presentation of proper vouchers. The Executive Secretary shall exercise administrative supervision of air and water pollution and water quality control programs adopted by the Commission and in the interim between meetings of the Commission shall have authority to perform in the name of the Commission all functions and duties delegated to him by the

Commission. The Commission may delegate any of the powers and duties vested in it by this act to the Executive Secretary except the adoption and promulgation of standards, rules and regulations; the revocation of permits; and the issuance, modification, or revocation of orders.

(b) The Commission may employ, compensate, and prescribe the powers and duties of such officers, employees, and consultants, as may be necessary to carry out the provisions of this act. The Attorney General or one (1) of its assistants shall advise and represent the Commission in all legal matters, except it shall be the duty of each district attorney in this State and county prosecuting attorney in each county to prosecute and defend, for the State, in all courts of the county or counties in his district or county, all causes, criminal or civil, arising under the provisions of this act, or any law or regulation promulgated by the Commission.

(c) The Commission is hereby designated as the State water pollution control agency for this State for all purposes of the Federal Water Pollution Control Act, as amended, (33 U.S.C. 466), and is hereby authorized to take all action necessary or appropriate to secure to this State the benefits of that act, and shall be empowered to receive and disburse funds within the limits of the appropriations to it, and funds which are or may become available from any source, except funds which may be allocated to the State Board of Health under Public Law 660 of the 84th Congress for construction of municipal treatment works in this State.

(d) The Commission shall have the right to call upon and receive the assistance of any officer, board, department, school, university or any other State agency, and officers and employees thereof, for any reasonable assistance necessary or beneficial in carrying out the provisions of this act.

(e) The State Game and Fish Commission shall be designated, by the Commission at its first meeting, as the agency to carry out the enforcement of this act, insofar as same pertains to industrial pollution, and as the agency to conduct water quality studies provided for under this act, under the direction of the Commission; and the State Board of Health shall be designated, by the Commission at its first meeting, as the agency to enforce the provisions of this act and the rules, orders, and regulations of the Commission, insofar as they pertain to municipal pollution, under the direction of the Commission, which designation shall expire on July 1, 1968. Such enforcement by such agencies shall be in addition to the enforcement of this act by the Commission. Such agencies shall receive compensation from the Commission in such amount or amounts as may be necessary to enable them effectively to perform the duties required of them by this act.

SECTION 6. Power and duties. The Commission shall have and may exercise the following powers and duties:

(a) General supervision of the administration and enforcement of this act and all rules and regulations and orders promulgated thereunder;

(b) To develop comprehensive programs for the prevention, control, and abatement of new or existing pollution of the air and waters of the State;

(c) To advise, consult, contract and cooperate with other agencies of the State, the Federal Government, other states and interstate agencies, and with affected groups, political subdivisions, and industries in furtherance of the purposes of this act and shall have the authority to enter into compacts with any other state or states for the purpose of achieving the objectives of this act with respect to interstate streams and waters.

(d) To accept and administer loans and grants from the Federal Government, except as set forth in Section 5 of this act, and from other sources, public or private, for carrying out any of its functions, which loans and grants shall not be expended for other than the purposes for which provided;

(e) To encourage, participate in, or conduct studies, investigations, research and demonstrations relating to air and water quality and pollution and causes, prevention, control and abatement and supervision as it may deem advisable and necessary for the discharge of its duties under this act;

(f) To collect and disseminate information relating to air and water quality and pollution and the prevention, control, supervision and abatement thereof;

(g) To adopt, modify, or repeal and promulgate standards of quality of the air and water of the State under such conditions as the Commission may prescribe for the prevention, control and abatement of pollution;

(h) To adopt, modify, repeal, and promulgate, after due notice and hearing, and to enforce rules and regulations implementing or effectuating the powers and duties of the Commission under this act and as the Commission may deem necessary to prevent, control and abate existing or potential pollution;

(i) To issue, modify, or revoke orders (1) prohibiting, controlling or abating discharges of contaminants and wastes into the air and waters of the State; (2) requiring the construction of new disposal systems, or air cleaning devices, or any parts thereof, or the modification, extension or alteration of existing disposal systems, or air cleaning devices or any parts thereof, or the adoption of other remedial measures to prevent, control or abate air and water pollution; and (3) setting standards of water quality or evidencing any other determination by the Commission under this act;

(j) To hold such hearings, to issue notices of hearing and subpoenas requiring the attendance of such witnesses and the production

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of such evidence, to administer oaths, and to take such testimony as the Commission deems necessary;

(k) To require the prior submission of plans, specifications, and other data relative to, and to inspect the construction of, disposal systems, or air cleaning devices or any part thereof in connection with the issuance of such permits or approval as are required by this act;

(l) To issue, continue in effect, revoke, modify or deny, under such conditions as it may prescribe, to prevent, control or abate pollution, permits for the discharge of contaminants and wastes into the air and waters of the State, for the installation, modification or operation of disposal systems, or air cleaning devices, or any parts thereof;

(m) To require proper maintenance and operation of disposal systems, or air cleaning devices;

(n) To exercise all incidental powers necessary to carry out the purposes of this act;

(o) The Commission shall in such manner as it sees fit delegate the duties and powers relating to air and water quality and pollution control to the agency members or associate members presently engaged in the several fields of water or air control of pollution. In cases of difference of opinion between such agencies as to their respective field of operation, the Commission shall delegate said responsibility to the proper agency, and the Commission's action therein shall be final;

(p) Nothing contained in this law shall be deemed to grant to the Commission any jurisdiction or authority to make any rule or regulation, recommendation, or determination or to enter any order with respect to air conditions existing solely within the property boundaries of commercial and industrial plants, works, or shops or to affect the relations between employers and employees with respect to or arising out of any air condition.

SECTION 7. Protection of confidential information. Any information relating to confidential processes, devices, or methods or manufacture of production obtained by the Commission or its employees in the administration of this act shall be kept confidential. Anyone violating this section shall be liable in a civil action for damages arising therefrom and shall also be guilty of a misdemeanor punishable as provided by law.

SECTION 8. Prohibitions; permits required. (a) Air. It shall be unlawful for any person to build, erect, alter, replace, use or operate any equipment which will cause the issuance of air contaminants unless he holds a permit from the Commission, except repairs or maintenance of equipment for which a permit has been previously issued. The Commission may revoke or modify any permit issued hereunder or deny any permit when it is necessary in the opinion of the Commission to prevent, control or abate air pollution. A permit shall be issued for the operation or use

of any equipment or any facility in existence upon the effective date of any rule or regulation requiring a permit, if proper application is made therefor, and no such permit shall be modified or revoked without prior notice and hearing as herein provided. Any person who is denied a permit by the Commission or who has such permit revoked or modified shall be afforded an opportunity for a hearing in connection therewith upon written application made within thirty (30) days after service of notice of such denial, revocation or modification. The operation of any existing equipment or facility for which a proper permit application has been made shall not be interrupted pending final action thereon.

The Commission under such rules and regulations as it may prescribe, may require the submission of such plans, specifications, and other information as it deems necessary to carry out the provisions of this act or to carry out the rules and regulations adopted pursuant to the provisions of this act. The Commission shall act on applications within ninety (90) days of their receipt in the Commission's principal offices.

(b) Water. It shall be unlawful for any person: (1) to cause pollution of any waters of the State or to place or cause to be placed any wastes in a location where they are likely to cause pollution of any waters of the State; and (2) to discharge any wastes into any waters of the State which reduce the quality of such waters below the water quality standards established therefor by the Commission. Any such action is hereby declared to be a public nuisance.

1. It shall be unlawful for any person to carry on any of the following activities unless he holds a current permit therefor from the Commission as may be required for the disposal of all wastes which are or may be discharged thereby into the waters of the State: (1) the construction, installation, modification or operation of any disposal system or part thereof or any extension or addition thereto; (2) the increase in volume or strength of any wastes in excess of the permissive discharges specified under any existing permit; (3) the construction, installation, or operation of any industrial, commercial, or other establishment including irrigation projects or any extension or modification thereof or addition thereto, the operation of which would cause an increase in the discharge of wastes into the waters of the State or would otherwise alter the physical, chemical or biological properties of any waters of the State in any manner not already lawfully authorized; (4) the construction or use of any new outlet for the discharge of any wastes into the waters of the State. Upon the passage of this act any person holding a current permit issued under Section 5929-15, Mississippi Code of 1942, Recompiled, shall be issued a valid permit upon proper application. All other persons required to obtain permits shall make application therefor and permits shall be issued after the Commission has reviewed the application for compliance with this act. Any person who is denied a permit by the Commission or who has such permit revoked or modified shall be afforded an opportunity for a hearing in connection therewith upon written application made within thirty (30) days after service of notice of such denial, revocation or modification. The operation of any existing equipment or facility for which a proper permit application has been made shall not be interrupted pending final action thereon.

2. The Commission under such rules and regulations as it may prescribe, may require the submission of plans, specifications, and other information as it deems necessary to carry out the provisions of this act or to carry out the rules and regulations adopted pursuant to the provisions of this act. The Commission shall act on applications within ninety (90) days of their receipt in the Commission's principal offices.

SECTION 9. Standards of water quality. (a) In order to carry out the purposes of this act, the Commission may set standards of water quality to be applicable to the waters of this State or portions thereof. Such standards of quality shall be such as to protect the public health and welfare and the present and prospective future use of such waters for public water supplies, propagation of fish and aquatic life and wildlife, recreational purposes, and agricultural, industrial and other legitimate uses. Such standards may be amended from time to time as determined to be necessary by the Commission.

(b) Prior to establishing, amending, or repealing standards of water quality the Commission shall, after due notice, conduct public hearings thereon. Notice of public hearing shall specify the waters for which standards are sought to be adopted, amended or repealed and the time, date and place of such hearing. Such notice shall be given by publication once a week for three (3) successive weeks in a newspaper published in Hinds County and in a newspaper published or having a general circulation in each county in which the waters to be affected may be situated, and by mailing notice to all county and municipal officials in the counties and municipalities affected, as well as to all persons and agencies who have had their names placed on the mailing list of the Commission.

(c) When standards of water quality have been adopted as provided herein, the Commission shall give notice thereof in the same manner as provided in subsection (b) of this section, and may further give notice thereof by registered mail to all persons holding permits who may be affected thereby. Upon the adoption of such standards of water quality, all persons affected thereby shall thereupon comply therewith. Provided, however, that where necessary and proper, the Commission may specify a reasonable time for persons discharging wastes into the waters of the State to comply with such standards, but no municipality as defined in Section 5929-04, Mississippi Code of 1942, Recompiled, shall be granted an extension beyond January 1, 1970, to comply with such standards, and upon the expiration of any such period of time, the Commission shall revoke or modify any permit previously issued which authorizes the discharge of wastes into waters of this State which result in reduction of the quality of such waters below the standards established therefor by the Commission.

SECTION 10. Proceedings before Commission. (a) Whenever the Commission has reason to believe that a violation of any provision of the act or regulation or of any order of the Commission has occurred, it may cause a written complaint to be served upon the alleged violator or violators. The complaint shall specify the provisions of the act or regulation or order alleged to be violated, the facts alleged to

constitute a violation thereof, and shall order that necessary corrective action be taken within a reasonable time to be prescribed in such order. Any such order shall become final unless the person or persons named therein request in writing a hearing before the Commission no later than thirty (30) days after the date such order is served. In lieu of such order, the Commission may require that the alleged violator appear before the Commission at a time and place specified in the notice and answer the charges complained of. The notice shall be delivered to the alleged violator or violators in accordance with the provisions of subsection (d) of this section not less than thirty (30) days before the time set for the hearing.

(b) The Commission shall afford an opportunity for a fair hearing in accordance with the provisions of Section 11 to the alleged violator or violators at the time and place specified in the notice or any modification thereof. On the basis of the evidence produced at the hearing, the Commission shall make findings of fact and conclusions of law and enter such order as in its opinion will best further the purposes of this act and shall give written notice of such order to the alleged violator and to such other persons as shall have appeared at the hearing or made written request for notice of the order.

(c) Any person who is denied a permit by the Commission or who has such permit revoked or modified shall be afforded an opportunity for a fair hearing as provided in subsection (b) of this section in connection therewith upon written application to the Commission within thirty (30) days after receipt of notice from the Commission of such denial, revocation or modification. On the basis of such hearing the Commission shall affirm, modify or revoke its previous determination.

(d) Except as otherwise expressly provided, any notice, or other instrument issued by or under authority of the Commission may be served on any person affected thereby personally or by publication, and proof of such service may be made in like manner as in case of service a summons in a civil action, such proof to be filed in the office of the Commission; or such service may be made by mailing a copy of the notice, order, or other instrument by registered mail, directed to the person affected at his last known post-office address as shown by the files or records of the Commission, and proof thereof may be made by the affidavit of the person who did the mailing, filed in the office of the Commission.

SECTION 11. Hearings. The hearings herein provided may be conducted by the Commission itself at a regular or special meeting of the Commission, or by any member of the Commission acting in its behalf, or the Commission may designate hearing officers who shall have the power and authority to conduct such hearings in the name of the Commission at any time and place. A verbatim record of the proceedings of such hearings shall be taken and filed with the Commission, together with findings of fact and conclusions of law made by the Commission. Witnesses who are subpoenaed shall receive the same fees and mileage as in civil actions. In case of contumacy or refusal to obey a notice of hearing or subpoena issued under this section, the circuit court shall have jurisdiction upon application of the Commission or its

representative, to issue an order requiring such person to appear and testify or produce evidence as the case may require and any failure to obey such order of the court may be punished by such court as contempt thereof.

SECTION 12. Inspection and investigations; maintenance of records.

(a) The Commission or its duly authorized representative shall have the power to enter at reasonable times upon any private or public property, and the owner, managing agent or occupant of any such property shall permit such entry for the purpose of inspecting and investigating conditions relating to pollution or the possible pollution of any air or waters of the State, and to have access to such records as the Commission may require under subsection (b) of this section.

(b) The Commission may require the maintenance of records relating to the operation of disposal systems, and any authorized representative of the Commission may examine and copy any such records or memoranda pertaining to the operation of disposal systems. Copies of such records shall be submitted to the Commission upon request.

(c) Any persons as hereinbefore defined discharging effluent, industrial waste, oil waste, or other waste disposal, including waste discharged by municipalities, into any waters of this State shall pay the following annual fee for inspection of the effluent, industrial waste, oil waste, or other waste disposal, for determination whether such disposal constitutes pollution:

Persons, firms or corporations employing less than fifty (50) employees \$50.00;

Persons, firms or corporations employing fifty (50) but less than one hundred fifty (150) employees \$100.00;

Persons, firms or corporations employing one hundred fifty (150) or more employees \$200.00;

Cities of less than five thousand (5,000) population \$50.00;

Cities of five thousand (5,000) population to fifteen thousand (15,000) population \$100.00;

Cities of fifteen thousand (15,000) population but less than thirty thousand (30,000) population \$200.00;

Cities of thirty thousand (30,000) population but less than fifty thousand (50,000) population \$500.00;

All cities over fifty thousand (50,000) population . . . \$1,000.00.

SECTION 13. Emergency rules, regulations and orders. In the event an emergency is found to exist by the Commission which, in its judgment, requires the making, changing, renewal or extension of a rule, regulation

or order without first having a hearing, such emergency rule, regulation or order shall have the same validity as if a hearing with respect to the same had been held after due notice. The emergency rule, regulation or order permitted by this section shall remain in force no longer than forty-five (45) days from its effective date and in any event it shall expire when the rule, regulation or order made after due notice and hearing with respect to the subject matter of such emergency rule, regulation or order becomes effective.

SECTION 14. Record of rules, regulations and orders. All rules, regulations, and orders made by the Commission shall be in writing and shall be filed in full by the Secretary of the Commission in a book, for such purposes, to be kept by the Commission which shall be a public record and open to inspection at all times during all reasonable hours. A copy of any rule, regulation or order certified by the Executive Secretary or Chairman of the Commission shall be received in evidence in all courts of this State with the same effect as the original.

SECTION 15. Request for hearing. Any interested person shall have the right to request the Commission to call a hearing for the purpose of taking action in respect to any matter within the jurisdiction of the Commission by making a request therefor in writing. Upon receipt of any such request, the Commission shall conduct such investigations as it deems necessary and may call a special hearing as provided in Section 4, or may schedule such matter for its next regular meeting and after such hearings and with all convenient speed and in any event within thirty (30) days at the conclusion of such hearing shall take such action on the subject matter thereof as it may deem appropriate.

SECTION 16. Transcript of hearings. All hearings before the Commission shall be recorded either by a court reporter or by tape or mechanical recorders and subject to transcription upon order of the Commission or any interested party, but in the event that the request for transcription originates with an interested party, such party shall pay the cost thereof.

SECTION 17. Penalties. (a) Any person found guilty of violating any of the provisions of this act, or any written order of the Commission in pursuance thereof, shall be deemed guilty of a misdemeanor and upon conviction thereof, shall be punished by a fine of not less than Fifty Dollars (\$50.00), and not more than Three Thousand Dollars (\$3,000.00) and cost of prosecution, or by imprisonment in the county jail not to exceed one (1) year, or both such fine and imprisonment in the discretion of the court, and, in addition thereto, may be enjoined from continuing such violation by proper proceeding brought in the chancery court of the county in which venue may lie. Each day upon which a violation of the provisions of this act occurs shall be deemed a separate and additional violation for the purpose of this act. The circuit court of the county in which venue lies shall have original jurisdiction to enforce this act.

(b) Any person who violates any of the provisions of, or fails to perform any duty imposed by, this act or any rule or regulation

issued hereunder, or who violates any order or determination of the Commission promulgated pursuant to this act, and causes the death of fish or other wildlife shall be liable, in addition to the penalties provided in subsection (a) hereof, to pay to the State an additional amount equal to the sum of money reasonably necessary to restock such waters or replenish such wildlife as determined by the Commission after consultation with the State Game and Fish Commission. Such amount may be recovered by the Commission on behalf of the State in a civil action brought in the circuit court of the county in which venue may lie.

SECTION 18. Appeals to chancery court. In addition to any other remedies that might now be available, any person or interested party aggrieved by any order of the Commission, shall have a right to file a sworn petition with the Commission setting forth the grounds and reasons for his complaint and asking for a hearing of the matter involved. The Commission shall thereupon fix the time and place of such hearing and shall notify the petitioners thereof. In such pending matters, the Commission and its members shall have the same full powers, as to subpoenaing witnesses, administering oaths, examining witnesses under oath, and conducting the hearing, as is now vested by law in the Mississippi Public Service Commission, and its members, respectively, as to hearings before it, with the additional power that the Executive Secretary may issue all subpoenas, both at the instance of the petitioner, and of the Commission. At such hearings the petitioner, and any other interested party may offer, present witnesses and submit evidence.

Following such hearing the final order of determination of the Commission upon such matters shall be conclusive, unless the petitioner, or such other interested party appearing at the hearing, shall, within fifteen (15) days after the adjournment of the meeting at which said final order was made, appeal to the chancery court of the county where the hearing was had, or of the situs in whole or in part of the subject matter of the hearing by giving a cost bond with sufficient sureties, payable to the State in the sum of not less than One Hundred Dollars (\$100.00) nor more than Five Hundred Dollars (\$500.00), to be fixed in the order appealed from, to be filed with and approved by the Executive Secretary of the Commission, who shall forthwith certify the same together with a certified copy of the record of the Commission in the matter to the chancery court to which the appeal is taken, which shall thereupon become record of the cause. Appeals shall be considered only upon the record as made before the Commission. The chancery court shall always be deemed open for hearing of such appeals and the chancellor may hear the same in term time or in vacation at any place in his district, and the same shall have precedence over all civil cases, except election contests. The chancery court shall review all questions of law and of fact. If no prejudicial error be found, the matter shall be affirmed and remanded to the Commission for enforcement. If prejudicial error be found, the same shall be reversed and the chancery court shall enter such judgment or award as the Commission should have entered. Appeals may be taken from the chancery court to the Supreme Court in the manner as now required by law, except that if a supersedeas is desired by the party appealing to the chancery court, he may apply therefor to the chancellor thereof, who shall award

a writ of supersedeas, without additional bond, if in his judgment material damage is not likely to result thereby, but otherwise, he shall require such supersedeas bond as he deems proper, which shall be liable to the State for such damage.

SECTION 19. Minutes, public records. The Executive Secretary of the Commission shall keep the minutes of the Commission, including all orders, rules and regulations, promulgated in a record book, or books, especially prepared for that purpose, which records containing such orders, rules and regulations shall be a public record and shall be open to the public for inspection during all reasonable public hours; and a certified copy of any such rules, regulations or orders shall be received in evidence in all courts of the State, with the same effect as the original.

SECTION 20. Rules, etc.--publication. Rules, regulations and orders of the Commission shall be published in the following manner: those having general application through the State shall be published once in some newspaper in and having general circulation throughout the State; those of special character having local application only shall be published once in some newspaper published in and having general circulation in the locality where such rules, regulations and orders are applicable; but if no such newspaper is so published and circulated, a copy of such rules, regulations and orders shall be posted in three (3) conspicuous places in which they are applicable, and such posting shall be all that is required under this act whether such notice remain posted or not.

Rules, regulations and orders of the Commission having general application shall also be filed with the chancery clerk in each county of the State, and those of special character shall be filed with the chancery clerks of the county or counties affected by such rules, regulations or orders.

SECTION 21. Oath and bond of Executive Secretary. Before entering upon the duties of his office, the Executive Secretary of the Commission shall take and subscribe to the constitutional oath of office and shall, in addition thereto, swear or affirm that he holds no other position or office in any political subdivision of the State, or any position under any political committee or party. Such oath, or affirmation, shall be filed in the office of the Secretary of State, and he shall execute and file with the State Treasurer a bond in the sum of Ten Thousand Dollars (\$10,000.00), conditioned on the faithful performance of his duties and that he will account for and pay over pursuant to law, all moneys received by him in the enforcement of this act. He shall be reimbursed for the premium on his bond from the general funds of the Commission.

SECTION 22. Seal. The Commission shall have a seal for the authentication of its orders and proceedings, upon which shall be inscribed the words "State Air and Water Pollution Control Commission - Mississippi - Seal," and which shall be judicially noticed.

SECTION 23. Repealing clause. Sections 5929-01 through 5929-17, and Sections 7106-101 through 7106-107, Mississippi Code of 1942, Recompiled, as amended, are hereby repealed; and, any and all other statutes in conflict herewith are hereby repealed to the extent of such conflict.

SECTION 24. Severability. If any section, subsection, sentence, clause, phrase or word or words of this act is for any reason held to be unconstitutional, such judgment shall not affect the validity of any remaining portion of the act.

SECTION 25. Short title. This act may be cited as the "Mississippi Air and Water Pollution Control Act."

SECTION 26. Effective date. This act shall take effect and be in force from and after July 1, 1966.

EXHIBIT D

MISSISSIPPI WATER QUALITY STANDARDS

REGULATION 1-67A
(AMENDED MARCH 1968)

STATE OF MISSISSIPPI
WATER QUALITY CRITERIA FOR
INTERSTATE AND COASTAL WATERS



MISSISSIPPI AIR & WATER POLLUTION CONTROL COMMISSION
416 NORTH STATE STREET - SUITE 3
P. O. BOX 827
JACKSON, MISSISSIPPI 39205

WATER QUALITY CRITERIA FOR INTERSTATE AND COASTAL WATERS

STATE OF MISSISSIPPI

SECTION I. GENERAL CONDITIONS:

1. It is the intent of the Mississippi Air and Water Pollution Control Commission that the pollution of waters of the State shall be prevented, eliminated or reduced to acceptable levels to protect the public health or welfare and enhance the quality of waters to insure their value for public water supplies, propagation of fish and wildlife, recreational purposes, agricultural, industrial and other legitimate uses.
2. The limiting values of water quality herein described shall be measured by the Commission in waters under consideration as determined by good sanitary engineering practice and after consultation with affected parties. Samples shall be taken from points so distributed over the area and depth of the waters being studied as to permit a realistic appraisal of such actual or potential damage to water use or aquatic life as may exist. Samples shall be analyzed in accordance with latest edition of "Standard Methods for the Examination of Water and Wastewater" or other methods acceptable to the Commission.
3. Exceptions.

In cognizance of the fact that certain waters of the State may not fall within desired or prescribed limitations as outlined, the Commission may authorize exceptions to these limits upon presentation of good and sufficient evidence of intent to comply to the extent practical or technically feasible. In no case shall it be permissible to deposit or introduce materials in waters of the State which will cause impairment of the reasonable or legitimate use to said waters.
4. In view of the fact that industry is continuing to produce new materials whose characteristics and effects are unknown at this time, such materials shall be evaluated on their merits as information becomes available to the Commission.
5. All criteria contained herein shall apply at all stages of streamflow which exceed the 7-day, 10-year minimum flow in unregulated, natural streams. This requirement shall not be interpreted to permit any unusual waste discharges during periods of lower flow.

SECTION II. MINIMUM CONDITIONS APPLICABLE TO ALL WATERS.

1. Free from substances attributable to municipal, industrial, agricultural or other discharges that will settle to form putrescent or otherwise objectionable sludge deposits.

2. Free from floating debris, oil, scum and other floating materials attributable to municipal, industrial, agricultural or other discharges in amounts sufficient to be unsightly or deleterious.
3. Free from materials attributable to municipal, industrial, agricultural or other discharges producing color, odor, or other conditions in such degree as to create a nuisance.
4. Free from substances attributable to municipal, industrial, agricultural or other discharges in concentrations or combinations which are toxic or harmful to humans, animal or aquatic life.
5. Municipal wastes, industrial wastes, or other wastes shall receive effective treatment or control (secondary or equivalent) in accordance with the latest practical technological advances and shall be approved by the Commission. A degree of treatment greater than secondary will be required when necessary to protect legitimate water uses.

SECTION III. SPECIFIC WATER QUALITY CRITERIA.

1. PUBLIC WATER SUPPLY:

Water in this classification is for use as a source of raw water supply for drinking and food processing purposes. The water treatment process shall be approved by the Mississippi State Board of Health. The raw water supply will be such that after approved treatment process it will meet the Public Health Service Drinking Water Standards (latest edition).

- a. Dissolved Oxygen: There shall be no oxygen demanding substances added which will depress the D.O. content below 4.0 mg/l.
- b. pH: The pH shall not be caused to vary more than 1.0 unit above or below normal pH of the waters and lower value shall be not less than 6.0 and upper value not more than 8.5.
- c. Temperature: Shall not be increased more than ten degrees F (10°F) above the natural prevailing background temperatures, nor exceed a maximum of 93°F after reasonable mixing.
- d. Bacteria: Fecal coliform not to exceed 5,000 per 100 ml. as a monthly average value (either MPN or MF count); nor to exceed this number in more than twenty percent (20%) of the samples examined during any month; nor to exceed 20,000 per 100 ml. in more than five percent (5%) of such samples.
- e. Chlorides (Cl⁻): There shall be no substances added which will cause the chloride content to exceed 250 mg/l in fresh water streams.
- f. Specific Conductance: There shall be no substances added to increase the conductivity above 500 micromhos/cm for fresh water streams.

- g. Dissolved Solids: There shall be no substances added to the waters to cause the dissolved solids to exceed 500 mg/l.
- h. Threshold Odor: There shall be no substances added which will cause the threshold odor number to exceed 24 (at 60°C) as a daily average.
- i. Phenolic Compounds: There shall be no substances added which will cause the phenolic content to be greater than 0.001 mg/l (phenol).
- j. Radioactive Substances: There shall be no radioactive substances added to the waters which will cause the gross beta activity (in the known absence of Strontium-90 and alpha emitters) to exceed 1000 micromicrocuries at any time.
- k. Chemical Constituents: Not to exceed the following concentrations at any time:

| <u>Constituent</u> | <u>Concentration (mg/l)</u> |
|-----------------------|-----------------------------|
| Arsenic | 0.05 |
| Barium | 1.0 |
| Cadmium | 0.01 |
| Chromium (hexavalent) | 0.05 |
| Cyanide | 0.2 |
| Fluoride | 0.7 - 1.2 |
| Lead | 0.05 |
| Selenium | 0.01 |
| Silver | 0.05 |

2. SHELLFISH HARVESTING AREAS:

Waters classified for this use are for propagation and harvesting shellfish for sale or use as a food product. These waters will meet the requirements set forth in the latest edition of the National Shellfish Sanitation Program, Manual of Operations, Part I, Sanitation of Shellfish Growing Areas, as published by the U. S. Public Health Service.

- a. Dissolved Oxygen: There shall be no oxygen demanding substances added which will depress the D.O. content below 4.0 mg/l.
- b. pH: The pH shall not be caused to vary more than 0.5 units above or below normal pH of the waters and lower value shall be not less than 6.5 and upper value not more than 8.5.
- c. Temperature: Shall not be increased more than ten degrees F (10°F) above the natural prevailing background temperatures, nor exceed a maximum of 93°F after reasonable mixing.
- d. Bacteriological: The median coliform MPN (Most Probable Number) of water cannot exceed 70 per 100 ml., and not more than ten

percent (10%) of the samples ordinarily exceed an MPN of 230 per 100 ml. in those portions or areas most probably exposed to fecal contamination during most unfavorable hydrographic and polluttional conditions.

- e. Toxic Substances, Color, Taste and Odor Producing Substances: There shall be no substances added, whether alone or in combination with other substances that will impair the propagation, marketability or palatability of shellfish or impair the use of waters requiring lesser quality.

3. RECREATION:

Waters in this classification are to be used for recreational purposes, including such water contact activities as swimming and water skiing. The waters shall also be suitable for use for which waters of lower quality will be satisfactory.

In assigning this classification to waters intended for water contact sports, the Commission will take into consideration the relative proximity of discharge of wastes and will recognize the potential hazards involved in locating swimming areas close to waste discharges. The Commission will not assign this classification to waters, the bacterial quality of which is dependent upon adequate disinfection of waste and where the interruption of such treatment would render the waters unsafe for water contact sports.

- a. Dissolved Oxygen: There shall be no oxygen demanding substances added which will depress the D.O. content below 4.0 mg/l.
- b. pH: The pH shall not be caused to vary more than 1.0 unit above or below normal pH of the waters and lower value shall be not less than 6.0 and upper value not more than 8.5.
- c. Temperature: Shall not be increased more than ten degrees F (10°F) above the natural prevailing background temperatures, nor exceed a maximum of 93°F after reasonable mixing.
- d. Bacteria: Fecal coliform not to exceed 1000 per 100 ml. as a monthly average value (either MPN or MF count); nor exceed this number in more than twenty percent (20%) of the samples examined during any month; nor exceed 2,400 per 100 ml. (MPN or MF count) on any day.
- e. Specific Conductance: There shall be no substances added to increase the conductivity above 1000 micromhos/cm for fresh water streams.
- f. Dissolved Solids: There shall be no substances added to the waters to cause the dissolved solids to exceed 750 mg/l as a monthly average value, nor exceed 1500 mg/l at any time.

- g. Toxic Substances, Color, Taste and Odor Producing Substances: There shall be no substances added, whether alone or in combination with other substances that will render the waters unsafe or unsuitable for water contact activities, or impair the use of waters requiring lesser quality.

4. FISH AND WILDLIFE:

Waters in this classification are intended for fishing, propagation of fish, aquatic life and wildlife and any other uses requiring water of lesser quality.

- a. Dissolved Oxygen: There shall be no oxygen demanding substances added which will depress the D.O. content below 4.0 mg/l.
- b. pH: The pH shall not be caused to vary more than 1.0 unit above or below normal pH of the waters and lower value shall be not less than 6.0 and upper value not more than 8.5.
- c. Temperature: Shall not be increased more than ten degrees F (10°F) above the natural prevailing background temperatures, nor exceed a maximum of 93°F after reasonable mixing.
- d. Specific Conductance: There shall be no substances added to increase the conductivity above 1000 micromhos/cm for fresh water streams.
- e. Dissolved Solids: There shall be no substances added to the waters to cause the dissolved solids to exceed 750 mg/l as a monthly average value, nor exceed 1500 mg/l at any time.
- f. Toxic Substances: There shall be no substances added to the waters to exceed one-tenth (1/10th) of the 48-hour median tolerance limit.
- g. Taste and Odor: There shall be no substance added, whether alone or in combination with other substances that will impair the palatability of fish or unreasonably affect the aesthetic value of the water.
- h. Phenolic Compounds: There shall be no substances added which will cause the phenolic content to exceed 0.05 mg/l (phenol).

5. AGRICULTURAL AND INDUSTRIAL WATER SUPPLIES:

Waters in this classification will be suitable for agricultural irrigation and livestock watering, industrial cooling and process water supplies, fish survival and other uses, except fish and wildlife propagation, water contact sports and source of potable water supply.

- a. Dissolved Oxygen: There shall be no oxygen demanding substances added which will depress the dissolved oxygen content below 3.0 mg/l.

- b. pH: The pH shall not be caused to vary more than 1.0 unit above or below normal pH of the waters and lower value shall be not less than 6.0 and upper value not more than 8.5.
- c. Temperature: Shall not be increased more than ten degrees F (10°F) above the natural prevailing background temperatures, nor exceed a maximum of 93°F after reasonable mixing.
- d. Specific Conductance: There shall be no substances added to increase the conductivity above 1000 micromhos/cm for fresh water streams.
- e. Dissolved Solids: There shall be no substances added to the waters to cause the dissolved solids to exceed 750 mg/l as a monthly average value, nor exceed 1500 mg/l at any time.

6. NAVIGATION AND UTILITY USE:

Waters in this classification will be suitable for navigation, survival of fish and any other use except source of potable water supply, fish and wildlife propagation, recreational activities, including water contact sports, agricultural irrigation and livestock watering.

- a. Dissolved Oxygen: There shall be no oxygen demanding substances added which will depress the dissolved oxygen content below 3.0 mg/l.
- b. pH: The pH shall not be caused to vary more than 1.5 unit above or below the normal pH of the waters and lower value shall not be less than 5.0 and upper value not more than 9.5.
- c. Temperature: Shall not be increased more than ten degrees F (10°F) above the natural prevailing background temperatures, nor exceed a maximum of 93°F after reasonable mixing.
- d. Specific Conductance: There shall be no substances added to increase the conductivity above 1500 micromhos/cm for fresh water streams.
- e. Dissolved Solids: There shall be no substances added to the waters to cause the dissolved solids to exceed 1000 mg/l as a monthly average value, nor exceed 2000 mg/l at any time.

WATER USES IN STREAMS

| <u>Waters</u> | <u>From</u> | <u>To</u> | <u>Classification</u> |
|-------------------------------|---------------------------|---------------------------|------------------------|
| <u>TOMBIGBEE RIVER BASIN:</u> | | | |
| Tombigbee River | Headwaters (East Fork) | Miss.-Ala. State Line | Fish and Wildlife |
| Bull Mountain Creek | Miss.-Ala. State Line | Tombigbee River | Fish and Wildlife |
| Buttahatchee River | Miss.-Ala. State Line | Tombigbee River | Fish and Wildlife |
| Sipsey Creek | Miss.-Ala. State Line | Buttahatchee River | Fish and Wildlife |
| Luxapalila Creek | Miss.-Ala. State Line | Highway #50 | Public Water Supply |
| Luxapalila Creek | Highway #50 | Tombigbee River | Fish and Wildlife |
| Yellow Creek | Miss.-Ala. State Line | Luxapalila Creek | Public Water Supply |
| Noxubee River | Headwaters | Miss.-Ala. State Line | Fish and Wildlife |
| Bodka Creek | Headwaters | Miss.-Ala. State Line | Fish and Wildlife |
| Sucarnoochee River | Headwaters | Miss.-Ala. State Line | Fish and Wildlife |
| Toomsaba Creek | Headwaters | Miss.-Ala. State Line | Fish and Wildlife |
| Alamochee Creek | Headwaters | Miss.-Ala. State Line | Fish and Wildlife |
| Oakatuppa Creek | Headwaters | Miss.-Ala. State Line | Fish and Wildlife |
| Tuckabum Creek | Headwaters | Miss.-Ala. State Line | Fish and Wildlife |
| <u>TENNESSEE RIVER BASIN:</u> | | | |
| Tennessee River | Miss.-Ala. State Line | Miss.-Tenn. State Line | Public Water Supply |

WATER USES IN STREAMS

| <u>Waters</u> | <u>From</u> | <u>To</u> | <u>Classification</u> |
|---|-------------------------------------|--------------------------------|------------------------|
| <u>TENNESSEE RIVER BASIN: (Continued)</u> | | | |
| Bear Creek | Miss.-Ala. State Line | Miss.-Ala. State Line | Fish and Wildlife |
| Cedar Creek | Miss.-Ala. State Line | Bear Creek | Fish and Wildlife |
| <u>NORTH INDEPENDENT STREAMS BASIN:</u> | | | |
| Hatchie River | Headwaters | Miss.-Tenn. State Line | Public Water Supply |
| Wolf River | Headwaters | Miss.-Tenn. State Line | Public Water Supply |
| Nonconnah Creek | Headwaters | Miss.-Tenn. State Line | Recreation |
| Tuscumbia River | Headwaters | Miss.-Tenn. State Line | Recreation |
| <u>PEARL RIVER BASIN:</u> | | | |
| Pearl River | Headwaters | Head Barnett Reservoir | Fish and Wildlife |
| Pearl River | Head Barnett Reservoir | City of Jackson Lowhead Dam | Public Water Supply |
| Pearl River | City of Jackson Lowhead Dam | Approx. 10 miles Downstream | Fish and Wildlife |
| Pearl River | Approx. 10 miles Down- stream | Mouth | Recreation |
| Bogue Chitto | Headwaters | Miss.-La. State Line | Fish and Wildlife |
| <u>MISSISSIPPI RIVER BASIN:</u> | | | |
| Mississippi River | Miss.-Tenn. State Line | Miss.-La. State Line | Fish and Wildlife |
| <u>YAZOO RIVER BASIN:</u> | | | |
| Tallahatchie River | Headwaters | Mississippi Highway #7 | Fish and Wildlife |

WATER USES IN STREAMS

| <u>Waters</u> | <u>From</u> | <u>To</u> | <u>Classification</u> |
|---------------------------------------|-------------------------------|-----------------------------|-----------------------|
| <u>YAZOO RIVER BASIN: (Continued)</u> | | | |
| Tallahatchie River | Mississippi Highway #7 | U. S. Highway #51 | Recreation |
| Tallahatchie River | U. S. Highway #51 | Confluence with Yazoo River | Fish and Wildlife |
| Yazoo River | Confluence Tallahatchie River | Mouth | Fish and Wildlife |
| <u>COASTAL BASIN:</u> | | | |
| Mississippi Sound | Contiguous | Mississippi Coast Line | Recreation |
| Graveline Bay | Head | Mississippi Sound | Shellfish Harvesting |
| Biloxi Bay | Mississippi Sound | Ebb and Flow Tide | Shellfish Harvesting |
| Davis Bayou | Biloxi Bay | Ebb and Flow Tide | Shellfish Harvesting |
| Old Fort Bayou | Biloxi Bay | Ebb and Flow Tide | Fish and Wildlife |
| Biloxi River | Biloxi Bay | Ebb and Flow Tide | Fish and Wildlife |
| Bernard Bayou | Biloxi Bay | Ebb and Flow Tide | Fish and Wildlife |
| Turkey Creek | Bernard Bayou | Ebb and Flow Tide | Fish and Wildlife |
| Tchoutacabouffa River | Biloxi River | Ebb and Flow Tide | Fish and Wildlife |
| Pass Christian Reef-Henderson Point | | | Shellfish Harvesting |
| St. Louis Bay | U.S. 90 Bridge | Ebb and Flow Tide | Shellfish Harvesting |
| Wolf River | St. Louis Bay | Ebb and Flow Tide | Fish and Wildlife |

WATER USES IN STREAMS

| <u>Waters</u> | <u>From</u> | <u>To</u> | <u>Classification</u> |
|---|-------------------------------|-------------------------------|---------------------------|
| <u>COASTAL BASIN: (Continued)</u> | | | |
| Cutoff Bayou | St. Louis Bay | Jourdan River | Fish and Wildlife |
| Jourdan River | Cutoff Bayou | Ebb and Flow Tide | Recreation |
| Bayou la Croix | Cutoff Bayou | Ebb and Flow Tide | Fish and Wildlife |
| <u>PASCAGOULA RIVER BASIN:</u> | | | |
| Pascagoula River | Mile 53 | Confluence of Escatawpa River | Fish and Wildlife |
| Pascagoula River | Confluence of Escatawpa River | Pascagoula Bay | Agricultural & Industrial |
| Pascagoula Bay | | | Agricultural & Industrial |
| Escatawpa River | Miss.-Ala. State Line | Mile 10 | Fish and Wildlife |
| Escatawpa River | Mile 10 | Pascagoula River | Agricultural & Industrial |
| Big Creek | Miss.-Ala. State Line | Escatawpa River | Fish and Wildlife |
| Bayou Cumbest | Head | Mississippi Sound | Shellfish Harvesting |
| Bangs Lake | Head | Mississippi Sound | Shellfish Harvesting |
| Bayou Casotte | Head | Mississippi Sound | Agricultural & Industrial |
| <u>SOUTH INDEPENDENT STREAMS BASIN:</u> | | | |
| Tangipahoa River | Headwaters | Miss.-La. State Line | Fish and Wildlife |
| Tickfaw River | Headwaters | Miss.-La. State Line | Fish and Wildlife |

WATER USES IN STREAMS

| <u>Waters</u> | <u>From</u> | <u>To</u> | <u>Classification</u> |
|---|-------------|-------------------------|-----------------------|
| <u>SOUTH INDEPENDENT STREAMS BASIN: (Continued)</u> | | | |
| East Fork Amite River | Headwaters | Miss.-La. State Line | Fish and Wildlife |
| West Fork Amite River | Headwaters | Miss.-La. State Line | Fish and Wildlife |
| Beaver Creek | Headwaters | Miss.-La. State Line | Fish and Wildlife |
| Bayou Sara | Headwaters | Miss.-La. State Line | Fish and Wildlife |

TRANSCRIPT OF PUBLIC HEARING
ON
BIG BLACK RIVER, MISSISSIPPI

COMPREHENSIVE BASIN STUDY

MONTGOMERY COUNTY COURTHOUSE

WINONA, MISSISSIPPI

4 NOVEMBER 1964

U. S. ARMY ENGINEER DISTRICT, VICKSBURG
CORPS OF ENGINEERS
Vicksburg, Mississippi

Public Hearing
on
Big Black River, Mississippi
Comprehensive Basin Study

Montgomery County Courthouse
Winona, Miss.
4 November 1964

The U. S. Army Engineer District, Vicksburg, held a public hearing in Winona, Mississippi, to discuss the comprehensive study on the Big Black River. Lt. Colonel James A. Betts, District Engineer, called the hearing to order at 1400 hours.

PRESENT:

VICKSBURG DISTRICT, CE

Lt. Colonel James A. Betts, District Engineer
Mr. George A. Morris, Chief, Engineering Division
Mr. Russell K. Stewart, Chief, Basin Planning Branch
Mr. DeKalb Wylie, Basin Planning Branch
Mr. Fred Bayley, III, Chief, Big Black Study Section
Mr. St. Clair Thompson, Projects Operations Branch
Mr. H. L. Mullin, Area Engineer, Greenwood
Miss Karen K. McBride, Technical Liaison Branch
Mrs. Bertie A. Davidson, Operations Division

PRESENT ALSO:

Mr. W. R. Applewhite, (Retired), Winona, Miss.
Mr. John L. Baskin, Farmer, Rt. 2, Winona, Miss.
Mr. Donald S. Bell, Forester, P. O. Box 455, Winona, Miss.
Mr. M. C. Billingsley, Mayor, Winona, Miss.
Mr. G. G. Bennett, Farmer, Route 2, Vaiden, Miss.
Mr. M. F. "Buddy" Bishop, Administrative Assistant, Congressman Whitten
Mr. A. C. Bagwell, Farmer and Ginner, Eupora, Miss.
Mr. H. H. Bagwell, County Supervisor, Eupora, Miss.
Mr. Mack L. Boykin, Lawyer, Box 87, Vaiden, Miss.
Mr. J. W. Braswell, Kilmichael, Miss.
Mr. Terry Brown, Rural Mail Carrier and Farmer, Stewart, Miss.
Mr. W. S. Brown, Stewart, Miss.

Mr. J. Frank Buchanan, County Agent, Kosciusko, Miss.
 Mr. A. R. Burford, Soil Conservationist, SCS, 4416 Meadow Ridge,
 Jackson, Miss.
 Mr. C. U. Canon, (Retired), Route 2, Vaiden, Miss.
 Mr. William E. Crenshaw, Farmer, Rt. 1, Box 250, Winona, Miss.
 Mr. Ernest Crowder, Farmer, French Camp, Miss.
 Mr. E. Robert Daley, Manager, Community Planning Department, 1504 State
 Office Building, P. O. Box 849, Jackson, Miss.
 Mr. P. R. Daly, Area Conservationist, SCS, Grenada, Miss.
 Miss Claire Davis, Executive Vice President (Waterways) Rivers & Harbors
 Association of Mississippi, New Capitol, Jackson, Miss.
 Mr. Davis Hurt, Merchant, City Alderman, Winona, Miss.
 Mr. J. B. Dean, Farmer, Merchant and Supervisor, Beat 3, Tomnolen, Miss.
 Mr. Jack Doler, Farmer, Winona, Miss.
 Mr. L. H. Flurry, SCS, Winona, Miss.
 Mr. Barry C. Freeman, Chief of Fisheries, Miss. Game and Fish Commission,
 P. O. Box 451, Jackson, Miss.
 Mr. Charles Hamer, Farmer, Kilmichael, Miss.
 Mr. J. T. Harris, Farmer, Route 1, Box 202, Winona, Miss.
 Mr. B. G. Harper, Dry Goods Merchant, Kilmichael, Miss.
 Mr. W. L. Heard, SCS, Box 610, Jackson, Miss.
 Mr. E. F. Henderson, Farmer, Kilmichael, Miss.
 Dr. H. L. Howard, Physician and Farmer, Winona, Miss.
 Mr. Horace G. Hutchinson, Supervisor, 115 Thornton St., Kosciusko, Miss.
 Mr. Julius K. Johnson, Farmer and Part-time SCS Worker, Kilmichael, Miss.
 Mr. H. M. Jones, Sanitary Engineer, Miss. State Board of Health,
 Box 1700, Jackson, Miss.
 Mr. John A. Killebrew, County Agent, Winona, Miss.
 Mr. Cecil Kirk, Duck Hill, Miss.
 Mr. W. C. Landrum, Lumber Manufacturing and Farmer, Durant, Miss.
 Mr. E. A. McCrary, Supervisor and Farmer, Sallis, Miss.
 Mr. Billy McMillan, Editor Newspaper, Kosciusko, Miss.
 Mr. J. T. McMinn, SCS, Ackerman, Miss.
 Mr. P. H. Money, General Insurance and Land Management, Winona, Miss.
 Mr. James E. Nail, County Agent, Box 597, Eupora, Miss.
 Mr. B. J. Nelms, Farmer, Vaiden, Miss.
 Mr. C. D. Oakes, Farmer & Supervisor, Vaiden, Miss.
 Mr. Dan Oakes, Farmer, Kosciusko, Miss.
 Mr. J. E. Peacock, Carpenter, 103 South Union, Winona, Miss.
 Mr. Jack W. Pepper, Water Engineer, Miss. Board of Water Commissioners,
 429 Miss. Street, Jackson, Miss.
 Mr. R. O. Pittman, Farmer and Cattle, Tomnolen, Miss.
 Mr. D. C. Quarles, Farmer, Weir, Miss.
 Mr. Rupert Ringolo, Attorney, Winona, Miss.
 Mr. E. W. Rucker, Dry Cleaning and Farmer, Kilmichael, Miss.
 Mr. B. B. Sanders, Farmer, Vaiden, Miss.
 Mr. O. W. Scott, Cattleman, Duck Hill, Miss.
 Mr. George D. Scruggs, Branch of River Basin Studies, Fishery Biologist,
 Bureau of Sport Fisheries and Wildlife, 2301 Drummond St., Vicksburg
 Mr. F. D. Shappley, Farmer, 800 Woodland Ave., Winona, Miss.

Mr. Donald A. Simpson, W.U.C., Carrollton, Miss.
Mr. Gordon E. Stone, Sanitary Engineer, U. S. Public Health Service,
P. O. Box 2131, Jackson, Miss.
Mr. J. E. Sullivan, Farmer, Winona, Miss.
Mr. W. C. Neill, President, Leflore Bank and Trust Co., Greenwood, Miss.
Mr. George H. Thomas, Manager, Montgomery County Chamber of Commerce,
P. O. Box 248, Winona, Miss.
Mr. V. C. Varior, Constable of Beat 1, Winona, Miss.
Mr. C. S. Vanderford, SCS, Kosciusko, Miss.
Mr. J. M. Vandiver, Farmer, Vaiden, Miss.
Mr. L. W. Wade, Farmer, Greenwood, Miss.
Mr. Claude A. Walker, Work Unit Conservation, Rt. 1, Box 9-C,
Eupora, Miss.
Senator Arnie Watson, Miss. Legislature and Cattle Farming, Box #1,
North Carrollton, Miss.

LT. COLONEL BETTS: Good afternoon, ladies and gentlemen. I would like to open this public hearing at this time. I am Lt. Colonel James A. Betts, District Engineer of the U. S. Army Engineer District, Vicksburg, Mississippi. The Department of the Army, Corps of Engineers, has been designated as the Field Leader for this comprehensive study that we are to discuss here today. Since the entire Big Black Basin lies within the limits of the Vicksburg Engineer District, we are directly responsible for developing a plan that will satisfy all of the water needs in this basin.

Since this study will be truly comprehensive, all of the Federal and State agencies that have experience in water resource development will play an active role in this investigation. For this reason, we have a Coordinating Committee made up of a representative of the Governor and representatives of the various Federal departments to serve in an advisory capacity. I would like to introduce two members of this Committee who are present with us today.

First is Mr. Sam Hailey, who is the Governor's representative from Canton, who is due here and has not arrived and I will introduce him specifically when he does arrive.

Next is Mr. W. L. Heard, the State Conservationist for the Soil Conservation Service. He represents the Department of Agriculture and will make a presentation later.

Other members of the committee who are unable to be with us today are:

Mr. Herbert H. Rogers, From the Department of Health, Education, and Welfare of Atlanta, Georgia.

Mr. Lenard Young, Federal Power Commission, Fort Worth, Texas

Mr. R. J. MacConnell, Department of Commerce from Fort Worth, Texas.

Mr. Kenneth D. McCall, Department of Interior, Muskogee, Oklahoma.

There are two other gentlemen here today who are active participants in this study.

First, Mr. George Scruggs who is representing the U. S. Fish and Wildlife Service of the Department of Interior that will participate in the Big Black Studies. Mr. Scruggs, will you stand up please. He will discuss the Fish and Wildlife Service participation later.

Also, Mr. Gordon Stone from the Public Health Service of the Department of Health, Education, and Welfare, who directs their field investigations on the Big Black River, will also make a statement later.

Mr. Stone, will you stand up please.

We have some other distinguished guests in our audience. I would like to take this opportunity to introduce them.

First of all we have Mr. Bishop, who is the Administrative Assistant to Congressman Whitten.

I also see Miss Claire Davis, who is the Executive Vice President of the Rivers and Harbors Association of Mississippi; Did I see Mr. Pepper arrive?

UNKNOWN: He came in.

LT. COL. BETTS: Also Mr. Jack Pepper, who is the Engineer for the Mississippi Board of Water Commissioners.

Representatives of the Vicksburg District who are with us today and will assist in the various phases of the hearing are:

First, Mr. George A. Morris, Chief of our Engineering Division.

Mr. Russell K. Stewart, who is Chief of our Basin Planning Branch.

Mr. DeKalb Wylie also of the Basin Planning Branch.

Mr. Fred Bayley III, who is the Chief of the Big Black Study Section, who is responsible for the investigations on the Big Black River for the Vicksburg District.

Also present today are Mrs. Bertie Davidson and Miss Karen McBride, who will record the minutes of this hearing.

I would now like to ask Mr. Heard to introduce representatives of the Department of Agriculture who are present.

MR. W. L. HEARD: Thank you, Colonel Betts, I don't know that I've seen them all yet, but I have two staff members here that I'd like to present.

First is Mr. A. R. Burford, Assistant State Conservationist of the Soil Conservation Service. By his side is Mr. P. R. Daly, who is Area Conservationist from Grenada. I see two of our Work Unit Conservationists - Mr. Flurry from Winona, and Mr. Simpson from Carrollton.

Are there any others that I may not have seen?

Mr. McMinn, from Choctaw County.

LT. COLONEL BETTS: I also notice that I was delinquent in not introducing another member of my staff. I'd like at this time to introduce Mr. Mullin, who is the Area Engineer from Greenwood in whose jurisdiction construction work in the Big Black area would fall.

We passed out cards for you to fill out identifying yourself for the purpose of the record. If anyone has not received one, if you will hold up your hand, one of the young ladies will see that you get one.

This public hearing is being conducted in accordance with the public notice which the Vicksburg District issued on 9 October 1964. This notice has been posted in conspicuous places throughout the Big Black Basin and has been widely distributed to individuals known to be interested in the study. I would like at this time for Mr. Bayley to read this notice. I will ask him to omit reading the inclosure as we will go further into that matter later in the hearing. Mr. Bayley.

MR. BAYLEY: Reads Exhibit A, Notice of Public Hearing.

LT. COLONEL BETTS: Thank you, Fred.

I would like to stress the point that meetings are being held in two locations strictly for the convenience of the local people. We intend that the matter presented by the Corps of Engineers or other agencies at the two hearings will be identical. Therefore, the only difference will be the presentations of local interests.

While we have referred to this as a public hearing, perhaps it should be referred to as an informational meeting. As most of you know, in the case of the normal public hearing at the initiation of investigations directed by Congress, local interests have usually developed a plan for a specific project which they believe is a way

to meet the need. The public hearing is for the purpose of giving the local interests an opportunity to present their proposal and for the Federal agency to receive the views, both for and against, the proposal for a specific project. In the case of a comprehensive basin study, such as we are discussing today, the purpose is to first determine the needs of the basin. After that, the studies will develop ways in which the needs can be met. So, we are here today to explain to you how we will approach the investigations, and to enlist your assistance by asking you to make known any views you may have as to the needs and the plans we should investigate for meeting those needs. So, we will first describe the procedure and objectives of the investigations and then throw the floor open for your suggestions as to the needs for water resource development that exist now or may emerge in the future. By water needs, I refer to such things as flood protection, water storage for power, recreation, water supply, pollution abatement, land treatment measures, and features to enhance the fish and wildlife value of the area. Of course, you may feel free to suggest the inclusion or elimination of any consideration of a reservoir, levee, and so forth, at any location that you desire. In the public notice, we specifically ask that you furnish us with a written statement covering any presentation made here today. However, we do not intend for this to inhibit your participation in the meeting, so please feel free to speak up even if you do not have a prepared statement.

As a result of this investigation, the Corps of Engineers and the other participating agencies are obligated to come up with plans of improvement, if any are feasible, to satisfy your requirements for the next 50 years, together with the indicated economic justification. Sufficient detail will be provided in the report for Congress to consider authorization of those projects that are needed in the next 10 or 15 years. As in the case of all other projects, the authorization and appropriation of funds for the construction of any recommended projects would depend on the approval and support of the local people.

I am going to call on Mr. Bayley at this time to give us a more detailed description of these studies, including a brief synopsis of the participation of all of the agencies that are involved. Fred.

MR. BAYLEY: The purpose of the investigation, as we mentioned earlier, is to formulate a plan to provide the best use or combination of uses of the water resources here in the basin to meet our present needs and all of the foreseeable needs in the future as best we can predict them. The major part of our studies will involve identifying these needs and then listing those projects that should be constructed by Federal, state or local agencies to satisfy these needs. Here are some of the things these projects should provide:

Adequate supplies of surface and ground water to supply the requirements for human consumption, agriculture, and industrial uses.

Necessary facilities or controls to assure an adequate quality of our water supply.

Water navigation facilities when they serve to improve the nation's transportation system.

Hydroelectric power where its provision can contribute advantageously to a needed increase for power supply.

Flood control or prevention measures to protect the people or their property including productive lands.

Land stabilization measures.

Drainage works to improve our available land.

Watershed protection and management measures where they conserve and enhance our resources.

Outdoor recreation and fish and wildlife opportunities where these can be enhanced by some type improvements.

While we are considering the means or the projects that we can use to develop the resources, we must maintain a proper attitude of stewardship of these resources. Proper stewardship may dictate in some instances, that open spaces, streams, and lakes be maintained in their natural state to serve for the best long-term interest of the people here in the basin. Proper stewardship may also mean that we must preserve and protect areas of natural beauty and scientific and historical interest so that they can be managed for the enjoyment and education of our people. Throughout the study, the well-being of all of the people shall be the over-riding determinant. All of the agencies involved in this study will be careful to make sure that we avoid the development of resources for the benefit of a few or the disadvantage of many.

The Big Black River Basin that we will cover in our plan of water resource development for the next 50 years is shown on this map here in the front of the room. The basin itself is made up of about 3400 square miles, since it is approximately 155 miles long and 22 miles in width. This area includes parts of these 11 counties:

| | | | |
|-----------|---------|------------|---------|
| Webster | Madison | Yazoo | Carroll |
| Hinds | Choctaw | Warren | Holmes |
| Claiborne | Attala | Montgomery | |

but in no case does it include a county in its entirety. Our considerations are not limited to the main stem or the valley section of the basin, but extend to the drainage divide, or the high ground, that separates the Big Black from the Yazoo Basin on the north and west and the Pearl River Basin on the south and east.

As you are well aware, there are many small tributaries that enter the Big Black at fairly even intervals throughout its length and, at the present time, these tributaries probably contribute more to the economy of the basin than the parent stream does. Certainly the economy of the Big Black area is primarily agriculture and as a result of changes in agricultural practices and other influences in the basin it has experienced a decline in population in recent years, and would now be considered rather sparsely populated.

In the first step of our investigation we will determine the needs for such things as water supply, flood control, land treatment measures, and so forth, for the present, and then extend these requirements for 50 years into the future. We also need to know the locations in which these needs will probably exist. We just mentioned the fact that the population is now, and has been for over 20 years, on a decline. Naturally, the number of inhabitants of the basin will have a considerable bearing on the extent of the various water needs in the future. This points up the fact that before we take off with projections of needs for such things as water supply and recreation, we need to know what future trends in population and economic activity we should anticipate. In order to provide this information, we, along with the Mobile District, contracted with Michael Baker, Jr., Inc. which is a Consulting Engineer firm in Jackson, to make what we call an Economic Base Study for the entire State of Mississippi and parts of western Alabama, and Louisiana east of the Mississippi River. Michael Baker has compiled statistical information for the past 30 years and in some cases longer, for such items as population, employment by industrial classification, personal income, available labor force and the number of households. Based on this data and their knowledge of such things as a shift in population from rural to urban, farming practices and industrial expansion, they will project population and employment over the next 50-year period. This will give us some basic guidance to use in developing water needs. For instance, the number of people that reside in an area is a key to the expected municipal water use. The agricultural production helps us to define the degree of flood protection we should provide, the amount of irrigation water that would be needed, and perhaps even the potential tonnage for navigation improvements. Population and personal income are directly related to the requirement for water-based recreation facilities and fish and wildlife opportunities. Employment by industry furnishes some guidance on the water supply that should be provided for industrial consumption and also influences the projected requirements for navigation and even to some extent, hydroelectric power. These examples illustrate the manner in which the indicators developed in the Economic Base Study will be applied, however, they do not by any means cover all of the applications. Michael Baker is now preparing the final report on the Base Study and I believe it will be presented to the general public some time in December in Jackson. However, you will probably see more about this in the newspapers later. I would like to stress the point that this is just a tool that is used in water resource development and is not considered an end product.

As also pointed out earlier, this investigation will pool the professional resources of most of the Federal and State agencies that are responsible for some phase of water resource development. Once the Economic Base Study is complete, this information will be furnished to all of the agencies that are participating in this study so that our plans for the future will all be based on the same anticipated growth.

I would like to tell you a little bit about the contributions of each agency. I will not go into a great deal of detail since Mr. Heard of the Department of Agriculture, Mr. Scruggs of the Fish and Wildlife Service, and Mr. Stone of the Public Health Service, will comment on their participation later in the hearing.

The Department of Agriculture's agencies: the Soil Conservation Service, the Economic Research Service, and the Forest Service will identify the land treatment measures that should take place in the basin. Such measures would not only reduce or eliminate erosion and thus enhance the land on which these measures take place, but it would also assist with other flood control improvements by reducing the quantity of runoff and sediment that would enter the channels, reservoirs, etc. They will also estimate the irrigation supply that should be provided and determine the need for flood control and associated improvements in the small watersheds throughout the basin.

The Public Health Service will participate in two phases of this study. After analyzing the industrial production, the agricultural pesticide treatment and similar activities, they will project the additional flow that will be required to maintain a suitable water quality in the streams throughout the basin. In addition, they will supply the estimates of water storage that should be provided for municipal consumption.

In comprehensive basin planning, the Bureau of Outdoor Recreation is responsible for providing an estimate of the number of people that would use water based recreation facilities. In the case of the Big Black, the visitation to such facilities might come from cities or towns located well outside of the drainage area. In fact, for each water need or water requirement, you might have a different area of influence. Bureau of Outdoor Recreation will first determine this area and then estimate the total recreation requirements before splitting out that part that should be assigned to water based facilities.

The National Park Service will identify those areas of natural beauty or historical and scientific interest that should be maintained in the present state.

The Bureau of Sport Fisheries and Wildlife will determine the present and future hunting and fishing demands in the basin and then with these demands in mind, they will determine what portion of them

can be satisfied by the existing habitat and then will recommend measures to enhance the fish and wildlife opportunities to meet the remaining requirement.

The need or demand for hydroelectric power will be covered by the Federal Power Commission with the assistance of the Southeastern Power Administration. However, in the early stage of the study, we normally assume that any power is needed that can be provided at a justified cost. The Power Commission and Power Administration can make more concrete recommendations after it is determined whether there are potential power projects.

The Corps of Engineers will study the flood damages on the main stem along with the associated drainage needs to determine the degree of flood protection that the project plan would include. We will also make an inventory of the potential commerce that could move on the Big Black to find out if we should give any detailed consideration to navigation projects on this stream.

Once we have amassed the total water requirements in the basin, we need to know what portion of these needs can be supplied by the existing water resources before we can develop a plan to satisfy the remaining demand. A paramount interest in this investigation is the quantity and quality of the stream flow available. Through the gaging program of the U. S. Geological Survey and the Corps of Engineers, we have ample data on the main stem concerning the stages and quantity of water at these locations in the past. In addition, the Geological Survey will tell us the volume of pumpage that the ground water sources could sustain.

The inventory of existing improvements in the Big Black will probably be rather brief. The Vicksburg District did some channel improvement work back around 1940 which consisted primarily of 43 cut-offs on the main stem and clearing trees and underbrush from the channel, and the Corps also did a little channel clearing work on 14 tributaries in the upstream portion of the basin. Soil Conservation Service has five small watershed projects in operation at the present time and are planning on other watershed projects. I am sure Mr. Heard will cover this more fully.

An important phase of our study of available resources is the identification of the more important fish and wildlife habitat areas. Some times man-made improvements will damage fish and wildlife opportunities. Therefore, it is important for our planning purposes to be aware of those areas that should remain in their natural state, so we can avoid locating projects at these sites.

Once we subtract our capability from the total demand, we can clearly see the job remaining. The various water needs will be grouped so that they can be associated with the projects that would answer

these requirements. For example, storage needs for municipal and industrial water supply, flood control, power, irrigation and pollution abatement, would be combined so that we can see what volume of water should be impounded in reservoirs scattered throughout the basin. In the case of flood control, of course, we would consider not only storage, but also channel improvement and levees, or probably a combination of all these three to provide the proper protection.

As a first step, we will compile an inventory of all of the obviously potential projects in the basin. Generally, the potential projects in the upstream portion of the watershed will be identified by the SCS and those in the lower extremes will be listed by the Corps of Engineers. Then these projects will be evaluated based on the benefit-cost ratio, the magnitude of the benefit that they provide and other considerations. When we refer to a benefit-cost ratio, we are talking about analyzing a project on an annual basis to see if we get a dollar or more in benefits for every dollar that we spend on the project. The construction cost of the project is written off over the life of the project which varies from 100 years for large reservoirs to 25 years for small channel improvements. In addition, the yearly interest rate is computed on the money that would be spent for construction and annual value is determined for replacements and maintenance and operation. We add all these up to get the annual cost of the project. Likewise, we analyze the benefits that would accrue. In the case of flood protection, for instance, it is based on the damages that would be prevented to crops, property and so forth, or for water supply it is the value of the volume of water available annually based on the cheapest alternative means of supplying this needed water. After we have made a rough analysis of the merit of each project, we will begin to build a total or several total plans. We will do this by considering the needs in the basin starting in the upstream reach and working down. We will include the best project or projects to satisfy this need. These projects may be land treatment and management measures; small reservoirs in the headwater sections or larger reservoirs near the tributary mouths or on the main stem; channel improvements which could be enlargement of the channel, removal of brush and trees from the channel, or in some cases, cutoffs, also levees; and perhaps even locks and dams. As we develop this plan, we must keep in mind the timing of the need. Obviously, some of the projects might be needed at the present and others would be recommended for inclusion at some time in the future, perhaps 25 to 30 years from now. We will always try to give proper weight to all water resource purposes whether it be flood control or fish and wildlife enhancement, watershed protection or land stabilization, water supply or recreation needs. The selected plan should serve the well being of the majority of the people. To accomplish this end, we are endeavoring to stay in close contact with the local groups during our investigation and at the completion of the study we will hold additional public hearings to present the plan that has been developed and to obtain comments from the local people.

At the conclusion of the comprehensive study and after its presentation to you, we will prepare a report presenting the recommended plan plus any alternative plans considered. Complete physical data on the improvements will be provided in the report along with the benefits and the costs that would result from their construction. Sufficient information will be presented to Congress to consider authorization of those projects that are needed within the next 10 or 15 years. Any long-term improvements will be discussed more generally since they should be reviewed prior to construction in any event. Appendixes will also be included in the report to describe the investigation by each participating agency. The final report on the Big Black River Basin Study is scheduled for completion in 1967 provided, of course, that funds are made available.

LT. COLONEL BETTS: Thank you, Mr. Bayley.

Has Mr. Hailey come in?

UNKNOWN: No.

LT. COLONEL BETTS: The Soil Conservation Service, the Economic Research Service, and the Forest Service of the Department of Agriculture are making some of the primary determinations in the study, as Mr. Bayley pointed out. I would like to call on Mr. Bill Heard at this time to explain the position of his department in the comprehensive plan and their degree of participation.

MR. HEARD: Thank you, Colonel. Although I'm the State Conservationist of the Soil Conservation Service for Mississippi, I'm speaking officially as the designated representative of the Department of Agriculture in this study. We would like to make clear the responsibilities that we are jointly undertaking in this study, so that it may be properly correlated in your mind with some of the other activities that are going on in this area. The objective of the comprehensive study, from our point of view, is to present a plan to guide the orderly development of all the water and related land resources of the Big Black Basin to keep abreast or ahead of the needs.

I'd like to point out here that our concept of water is that basically it is a product of the land, and the land resources of the area are therefore very closely allied with the production of water for various purposes that it may be required for.

The Big Black River Basin, as you all know, is primarily an agricultural area and will, we think for the foreseeable future, continue to be an agricultural area. Most of the land is privately owned and is operated by family-size farm units. More than 50% of the farmers within the basin have a gross income of less than \$2,500. One of the major objectives, therefore, that we contemplate is the need to improve the lot of the low-income farmer in this area. We believe that this

can be done largely, not entirely, but largely through application of appropriate soil and water conservation measures. These include measures for flood control, irrigation, stabilization of critical eroding lands, and so on.

It has been mentioned here two or three times now that the Department of Agriculture is playing a major role in the development of the overall plan for the basin. The Soil Conservation Service has leadership responsibility for the Department in teaming up with the U. S. Forest Service and the Economic Research Service. However, each of these has specific responsibilities which must be coordinated within the Department group in the collection and analysis of data. We in the Department expect to work closely with the Corps of Engineers, with the Department of Interior and its agencies and the Health, Education, and Welfare Department in the Big Black Studies. This is a requisite if we are to come up with something reasonable which the various Departments will sometime in the future be able to use as somewhat of a guideline by which their functions will be delineated. I'd like to remind you, too, that our Department was originally involved in the Big Black Studies by virtue of its authority to make comprehensive investigations under Section 6, of Public Law 566. In fact, the appropriations from this source are now being used to defray most of the costs of its investigations, although some of it comes on a reimbursable basis from the Corps. Investigations and surveys of water and related land uses were started in the Big Black early in 1963, then under the sponsorship of the Mississippi Board of Water Commissioners, to whom we still have a responsibility to provide information and a report.

However, in July 1964, these surveys took on greater significance. In this concept, which we call the Comprehensive River Basin Study, provisions were made for four major departments to jointly participate in studying needs and developing an overall plan for water resource projects to meet the immediate and long-time needs. Now in carrying out this study, the Department will be interested in all studies that are of interest to agriculture and we therefore will participate in a number of specific studies.

I would like to point out here, first, that one of the things we are interested in is upstream flood control or flood prevention, whichever you call it. You see here a somewhat smaller map than the other one on which are delineated 37 tributary watershed areas, all of them being less than 250,000 acres. These will form the basis for our particular studies. We have selected, although we will make some studies in each of them, these outlined in red as the sample studies in which we will come up with a rather thorough analysis of the land-use conditions and the needs within that area for specific activities in the way of land treatment and land resource development, as well as flood prevention, channel improvement and so on. This, here (indicating) really represents a typical study area and will give you some idea of the extent to which we will study in rather detail some of these areas.

Most of these tributaries that we refer to here flood rather frequently. The Department will study each of the small sample areas and the other 32 in some less detail to determine the needs for adjustments in land use, land treatments, to control erosion and excessive runoff, the need for small dams to hold back floodwater from damaging crops on productive bottomlands, and need for channel improvements on tributaries to carry runoff to the main stem of the Big Black. Studies will include estimating flood and sediment damages, and estimating costs and benefits for a number of alternate combinations of structural measures to arrive at a feasible and economical system of measures.

The Department will also engage in studies to determine present and future water requirements for irrigation of agricultural lands. This will include studies of plant requirements, yield or response of plants to supplemental irrigation, increased cost of production, availability and cost of providing water, cost of and net returns from irrigation.

Most all of us are interested in drainage. The Department will determine the extent of lands with drainage problems and the measures needed to solve drainage problems both on individual-type farm basis and a group-type basis.

On water supply, which Mr. Bayley has well described here, we feel like we have a direct responsibility in helping to develop an understanding of the opportunity, the economic opportunity, afforded this area because of a rather abundant water supply. We therefore expect to share in determination of availability of surface water within these tributary streams to analyze the effects of land-use and land-management practices in the upstream watershed area development on the flow characteristics of streams. We will determine potential storage and the cost of each of the proposed upstream floodwater retarding damsites and in the final overall plan we will provide data for meeting future needs for water for recreation, fish and wildlife, municipal, industrial and other beneficial uses of water in keeping with the type of authorization under which the department operates in this authorized program.

With respect to soils and land-use which I referred to at the outset, we expect to make studies in the basin to determine potential capability of land in the basin for production of pastures, crops and woodland products. Mr. Scott, I know you are very much interested in this, as past President of the Mississippi Association of Soil Conservation District Commissioners and a landowner in this area. This will include a study of soil, land capability, erosion problems and needed land treatment to bring watershed lands up to minimum acceptable management levels. The study will also indicate water and land related improvements and management practices necessary to realize optimum future land-use patterns.

With respect to recreation and fish and wildlife responsibilities, and here we're thinking about on-farm activities, and those related to the small watershed programs that may be carried out, we conduct studies to determine possibilities of farm income-producing recreation enterprises, recognizing that more and more farmers will be using their lands to meet the growing demands of the public for recreation enterprises, which include fishing and hunting. We will also locate potential sites in small watershed projects for water-based recreation and will estimate costs for water storage for these purposes. There will be some other special studies, such as present and future needs for rural water supply, present and future needs for forestry resources and present and future projections of agricultural production. Again with respect to coordination, we are working closely at present and will continue with all agencies participating in these studies including not only the Federal but the state and local agencies. At the local level, I want to speak particularly at this point. We will be responsive to ideas and views of soil conservation districts and water management districts within the basin, and we believe they ought to have an opportunity to speak with respect to recommendations which we include in our report regarding land use and land treatment. There are 11 of these soil conservation districts now operating in the Big Black River Basin. There are also 17 water management districts in the basin, all of which are co-sponsoring with soil conservation districts P.L. 566 watershed projects. I might say, incidentally, that there are 5 of these projects that have reached the stage of authorization for operation. In fact, two of these projects are virtually complete at the present time, and the third one will get underway in full swing sometime next year. The Department has recognized the contribution that the soil conservation districts and water management districts have made in carrying out plans for developing resource-type projects, and as I have said, we believe that they should continue to share this responsibility in the planning.

When the organization of the contemplated Big Black Basin District, authorized by House Bill 614 of the Regular Session of the Mississippi Legislature of 1964, is completed, the Department expects to solicit the views and ideas of the Board of Directors of this political subdivision of the State, and to work with it in every way possible in helping it to prepare a long-range plan of action for its participation in the development of the land and water resources of the basin. It is expected that information and reports which the Department develops will be of particular assistance to this District as it plans for a program of progressive action in the Basin.

The Department will continue to work closely with the Mississippi Board of Water Commissioners, which is the original sponsor of agricultural studies within the Big Black and several other basins in the State.

We expect to freely exchange information with the Federal agencies and cooperate in resolving any conflicts which may develop on allocation of water to competing purposes that affect agriculture.

Now with respect to reports, in addition to the central report that the Corps of Engineers will prepare, the Department expects to prepare a report including a plan covering projects to be carried out by the Department. This plan will be in sufficient detail for Congressional authorization of projects recommended for construction in the next 15 years, and will also make reference to projects that will be needed for a fifty-year period.

Now again, I would like to repeat that this report, as well as the primary report, will certainly be prepared with full coordination with all the other departments and agencies.

Thank you.

LT. COLONEL BETTS: Thank you, Mr. Heard.

At this time, I believe the statement for the Fish and Wildlife Service is to be made by Mr. George D. Scruggs of the Bureau of Sport Fisheries and Wildlife. Mr. Scruggs would you come forward, sir?

MR. SCRUGGS: I have here a letter statement of the U. S. Fish and Wildlife Service of the Bureau of Sport Fisheries and Wildlife, signed by Mr. Walter A. Gresh, Regional Director. The statement reads as follows: (Reads Exhibit B)

LT. COLONEL BETTS: Thank you, Mr. Scruggs.

Next I would like to call on Mr. Stone from the Public Health Service. Mr. Stone.

MR. STONE: I am Gordon E. Stone, Sanitary Engineer, with the Public Health Service. (Reads Exhibit C)

I'd like to make a comment here that might not be explained by this paper, that we are in two programs at once. We have a program stretching all the way from the Savannah River eastward to the Mississippi River, but not including the Mississippi. Our organization is studying all those rivers this way. The pertinent thing today is that the Big Black is one of those. At the same time, the Engineers are studying the Big Black, along with the other Federal agencies that have been mentioned, and we then are part of the Engineers' program at the same time that we are working on all the southeastern rivers. I think I've made that plain enough. Thanks, so much.

LT. COLONEL BETTS: Thank you, sir.

At this time, I had hoped to call on Mr. Sam Hailey, the Governor's representative on the Coordinating Committee, to make a statement. One more check to make sure he's not here yet. In Mr. Hailey's absence, I'd like to assure you that we do have as a

member of the Coordinating Committee, Mr. Hailey, who was appointed by the Governor, and who will insure that at every level the State interest and State agencies are fully integrated in this, and I can assure you at this particular point that all of the Federal agencies will deal directly with and work very closely with each of the State agencies who are in fact counterparts of the Federal agencies. I think that we should have, by this time, made it clear that this effort is rather comprehensive in nature. In other words, we are dealing with all of the uses of water and bringing into the study all the people who have an interest in it and particularly you, the local people.

We have brought along with us a movie that we would like to show you now to possibly help further in illustrating what a comprehensive study of a river basin is. This particular one was made on the Potomac River. The film was made by the Baltimore District of the Corps of Engineers, but I would like for you to discount that particular fact since the film could properly be made and presented by whatever agency was designated the field leader for the study within a given basin.

As you know, all water basins and all watersheds are not the same and I would like for you to keep this in mind - particularly the historical development within the Potomac Basin as you see it. The water needs, the problems, differ in variety and magnitude within each basin. However, I feel that if you will overlook for the instant some of the names, the historical development, some of the places in the Potomac, you will get a pretty good idea of the complete work that goes on in a comprehensive basin plan, particularly the way in which the Federal and State agencies work together in developing this plan. I think it's also very important to point out to you as you see this movie that while we come up with a plan, in the final analysis the decision on these projects is made by the Congress in which case you the local people play a very important part. I think you'll find this movie very interesting.

(Movie is shown.)

LT. COLONEL BETTS: Analyzing and taking a look at the Potomac Basin as compared to the Big Black, the water needs are basically different. I think that the film for your purposes, and as you should look at this, places an undue emphasis on reservoirs as such. This is made necessary by the tremendous water supply required in the large metropolitan area of Washington. However, I hope that the film showed you the completely comprehensive nature of such planning that we are now about to get underway.

At this particular time I would like to open the floor to comment by representatives of any local groups or any individuals. I recall that I said that this is an informational type public hearing we are

having today, and rather different from the type of public hearing that will come later on when we will be thinking in terms of specific projects, as you saw in the film. I think it would be only proper that I, in addition to opening the floor for statements or comments, should open the floor to questions. As I do so, and since we are making a record of the hearing, I would like you, as you are recognized and as you desire to make a statement, to please properly identify yourself. If you so desire, we have a "mike" up here that is also going to the tape recorder - don't let that scare you - if you would like to come forward and use the podium, please feel free to do so. I invite both written or oral statements and comments of any kind, and questions.

I have from the name cards that were handed out, indications from some people that they would like to make a statement. I will try to call on these in order and then those who didn't indicate, may care to make a statement.

First of all - Mr. Scott. Would you like to come up and make a statement, sir, or how would you like to do it?

MR. SCOTT: Colonel Betts, Mr. Bayley, Mr. Heard, I'm speaking for the Montgomery County Soil Conservation District Commissioners. We indorse this program heartily. Mr. Heard just told you that Big Black - the economy of Big Black - people's income was around \$2,500 a year. That is awfully small. I can remember back in '33 when President Roosevelt went into office that we started our program - plowing up program - Montgomery County's quota was 150 pounds of lint cotton per acre. This last year we were over 750 pounds a year. In that year, I live out of the Big Black Area - I am just above it, my quota was the same as the average - 150 pounds a year. This year we have already gathered over 1,000 pounds of lint cotton per acre and still got some to pick, but my place is under the program of soil conservation. We've made every acre produce the stuff that it ought to produce, and I can see no reason why the rest of Big Black couldn't be done the same way. I bought some corn this week from Mr. Hammond and he showed me he was gathering over 3 bales per acre. That's tremendous, gentlemen, and when you look at the Big Black Area - think of the economy that it would mean to the country, the potential economy, if that could be developed. We could drain the area as it should be drained and put each acre producing what it ought to produce, how much the economy could be raised and the standard of living could be raised.

I have a statement prepared here from the District Commissioners, but it's a little lengthy. It's just in addition to what everybody has stated here and I'm not going to burden you with reading it, so I'm just going to pass it on, Colonel Betts. I thank you. We indorse this program 100% and heartily.

LT. COLONEL BETTS: Thank you, Mr. Scott. We appreciate the statement (Exhibit D) for the record.

Next, I'd like to call on Dr. Howard, who indicated he would like to make a statement.

DR. HOWARD: I do not have a prepared speech to make because I didn't know it would be in order and I could make this more concise and to the point, but I haven't. I probably will digress at times. Mr. Scott is representing the drainage district here. I am representing over 75% of the people in the Hays Creek Area. I don't know right now how many acres are in there. I don't have all the statistics. I'm for soil conservation and practice it on my farm in Carroll and Montgomery Counties. I have had, I don't know how many thousand, probably several hundred thousand pine seedlings on my farm. The Soil Conservation people have been very cooperative and they have fixed some land that needed pine seedlings. There's one unfortunate thing about it and I would like to see the government or somebody do something about it. We can't see the stuff; it's up there - beautiful trees up there, but nobody wants to pay any price for it now - can't even get anybody - there's not a pine pulp mill in this part of the country. We've got pine trees we'd like to sell for pulp wood. The forest needs thinning out so we'd have better trees, but there's nobody around that has any use for sweetgum and stuff like that. We have stuff there but nobody wants to buy it. I'll bet you'll find that Montgomery County has cooperated about as well as anybody and also Carroll County. These people are my friends. Donald Simpson back there has done a world of work for me down in Carroll County and also in Montgomery, and these places have become almost void of erosion. One of the main erosion points - you better get on some of these folks and tell them to start sodding these roads - that's where a lot of your sedimentation is coming from. Now I'm here for soil conservation and I'm here for all that you've added to it. Mr. Heard and I were schooled at the University of Mississippi and we got broke into this program in 1933 at a CCC Camp in Blue Mountain, Miss. He was head forester and I was an officer in the army and I was doctor for the CCC Camp. But I am also for my fellow farmers here. This county has lost approximately 20 to 24% of its population since 1940; Carroll County has lost about 40% of its population. Of course, they had to move away because the hills wouldn't support them, but now they are down to some cultivatable land. You go around, you'll see most of this land is making crops for these little families. Mr. Heard told you - these small families - that's the only way to survive. Mr. Scott, there, is a big farmer and I have a good deal of crop land but there's not too many people that have big farms. Now I'm willing for them to go up my hollows there - in fact I put up some last summer - for ponds to hold back the water, but I am not in favor of going up and taking any more of our productive land out of cultivation. You tell Jamie Whitten about this too, when you go back, because Jamie's gonna need all

these folks down here. Jamie's a good friend of mine - I introduced him the last time he was down here. We want our folks to survive here. I'm also for trying to keep the water off the folks down yonder, but I'm against you putting water on us. Now that's not gonna work. We've got hollows we'll let you have to put up dams on, but they're considering dams hundreds of yards long. They want to put up 15 dams in this watershed and everyone of them is on cultivatable land. One poor old negro out here is gonna lose his whole farm - land that he could cultivate. He needs protection - nothing left there but an old eroded hill. He's got pine trees on there, but I tell you he can't sell them.

I don't know what your proposition is - you haven't explained what it's gonna cost. When you go down to buy something, you want to know what it's gonna cost you, whether you can pay for it, whether you're financially able to or not. Well this thing is over a long period of time. We don't know what's going to happen. You say maintain indefinitely. Well, in the dictionary it says indefinite is forever. We don't know what we're gonna put on our children. Well, I want something worked out - something definite - what it's gonna cost me. I don't know whether the government's going to pay for this or not but you can run a lot of those farmers bankrupt. Coming back, they only make \$2,500 per farm, according to Mr. Scott, and if you go in there and tax them - they're taxed to the gill right now. Just going through some of the old home figures I have on my farm - 102 years old - old place in the family - a 1903 tax receipt \$7.79 for 240 acres. Boy, if you haven't got a homestead exemption now, you ought to get one of those tax figures.

I don't want to see my fellow farmers get inundated and then what they have below that taxed out of existence. The reason I got interested in this thing over in this part - I signed the thing to begin with, but I thought they were gonna put up small ponds in the hollows, retention dams and the sort and clean out Big Black, which I think they should do. But good Lord, they came around and gonna dam up some of the best land my wife and my two brothers-in-law and sister-in-law have right on the side of the main county road - expected to be a state road. They never did see the hollows over there. I got some hollows over there and Mr. Simpson over in Big Sand area, if you have still got it, that I would let you all have for nothing if you'll dam it up, and be glad to let you have it - but I want this thing clarified. I don't know whether you even know about it or not. We've got men here that could really give you all the statistics on this thing and how vicious this thing looks. The Mulberry Creek area - those things are vicious - now who got this thing up. I don't know whether it was gotten up by a local county agent or our local soil conservation man or local forestry man. I got an idea it was passed on to them by the state. If this thing comes up again, we're going to have another mass meeting - we've got the petitions all fixed and already been signed by over 75% of the people.

A friend of mine the other day said, "We better start saving our land and use what we've got - our cultivatable land. We're putting water on a lot of it; we're pouring concrete on it for airports; we're putting super highways; we're building subdivisions and big cities are coming up all the time." The other day - I've forgotten how often it is, but just every few months you've got a new city on account of the population and I predict this - the next generation and probably some of us will see it, the government's gonna pay us to get bulldozers and clean off our lands to raise stuff for the people. The atomic bomb is probably going to do some of it before that time, but somebody has got to bulldoze off some of these pine thickets. I got a neighbor right here in Montgomery County that has already bulldozed off the hillside of pine trees and planted cover crops, because he found out right now that we cannot get anything out of all this pine timber which is nice to take care of erosion, but you can't eat the stuff. You've got to pay taxes on it and you can't sell it. Somebody better help us out on some of that. Tell Jamie Whitten that.

LT. COLONEL BETTS: Thank you, Dr. Howard.

I'd like to point out that our purpose at this time is to come up with a plan based upon a very sincere examination of the needs and desires of the local people. As we get into this later on when specific items which will implement this plan come into view, at that time there will be additional public hearings where additional representations on the part of the people can be made known. I thank you very much for your statement. It's important to us.

Next, I would like to call on Miss Claire Davis, who is Executive Vice President of the Rivers and Harbors Association of Mississippi. Miss Davis, would you come forward?

MISS DAVIS: As Colonel Betts has told you, I am Executive Vice President of the Rivers and Harbors Association. I recognize many of you seated here and I'm glad to see you. Our Association has no State or Federal association whatsoever. We are merely a state-wide organization, responsible to the people in the State of Mississippi - you people here in this room today. Our business is for the overall development of the entire waterway system of the State of Mississippi. That involves our ports, our harbors, our inland waterway systems, our small watersheds, recreation, water retention, and water storage. As you can see we have quite a job to do. We are interested in every area possible. In the 1964 General Session of the Legislature, we were the ones who were handed the information to draw up the legislation to be passed for the setting up of your Big Black Waterway Basin District, which, as you see, is outlined here. Now this legislation states, "that any of the counties that lie partly within the district are eligible," not just that portion of the county that is within the district but the entire part of the county. In this way we will not only be able to help those that lie within the red

line (referring to hearing map), but those that lie without the red line. This makes it possible for all of you to receive the protection and also the information that you need. I have one request that I need to make here today. The information and work that we do can only be done when you make it known to us. Your request is absolutely necessary in my office. Your local representatives and senators know me, know where I am located, and know my address, and you can contact them at any time. If there are any questions that you have with regard to the legislation that was passed, I will be more than happy to try to answer questions on this matter. Any others, I think I should be able to help you with too. We are wholeheartedly in support of the entire development of the basin and offer our support in any way that we can, Colonel Betts.

LT. COLONEL BETTS: Thank You, Miss Davis.

Moving right along, Mr. Landrum, Durant, Mississippi, indicated he might want to make a statement, time permitting. Time does permit, Mr. Landrum.

(No response.)

Mr. Wade, Greenwood, indicated he might want to say something. Mr. Wade, do you care to make a statement at this time, sir?

MR. WADE: I don't know whether I want to make a statement or not. I came here to listen and see what it's all about. When do you expect this preliminary study to be completed, and where do we go from here?

LT. COLONEL BETTS: If I may reiterate, sir, the purpose of this study is to examine completely the comprehensive water needs of the Big Black Basin jointly with all the Federal and State agencies and determine what these needs are, to work out a comprehensive plan for meeting these needs in the most economical manner that we can. This will project the requirements for 50 years and would, when it goes to Congress, indicate those projects which Congress could then authorize - those projects which are needed within a period of 10 to 15 years.

MR. WADE: I am interested in the project. My property is down at Vaiden and every time they flush a commode up here at Winona, it overflows and I would like to see something done about that. I am for Coldwater Creek.

LT. COLONEL BETTS: Than you, sir.

We have with us, as I indicated before, Mr. Jack Pepper who has indicated that he may file a written statement later. Mr. Pepper, is there anything that you would like to say at this time?

MR. PEPPER: We will work with you any way we can. If we can help you or any of the other agencies involved in this, call on us and we'll do our best to get the local story.

LT. COLONEL BETTS: Thank you.

We also have Senator Arnie Watson who indicated that he would make a statement if deemed necessary. Would you like to say anything at this particular time, sir?

SENATOR WATSON: Thank you, sir. I really would like to thank this panel for the information they brought us. The reason that I came this afternoon was for information. As a senator, I represent our district in the Mississippi State Legislature. I represent, first of all these \$2,500 families you are talking about in Calhoun County. Next I represent all the families - the landowners - in the county, civic organizations, municipal organizations, and industrial organizations, and when these bills come before the Legislature, and I'm sure these will get there, it is our duty to try to use our best judgment for the people like Mr. Scott, landowners, and all the civic leaders as to what should be done with these bills pertaining to our county and district. Certainly we want to give them thorough study, and I think with the information you are giving out, we will know more about how to deal with the bills at our next meeting and the meetings in the years to come. It is this information we are depending on for the best interest of our people back home. We may have to get a psychologist to help us with some of our problems. I'm sure these gentlemen realize what your problems are. All of us have to be sympathetic and look forward to our future industrial and agricultural progress. As a member of the Agricultural Committee, Fish and Wildlife Committee and Forestry Committee in the Senate, I am sure that I'll see a good many bills pertaining to these very questions we are studying here this afternoon and it is beneficial to me to be here and get this information, and as your representative in the Mississippi Legislature, I welcome more suggestions from all you people. I'm sure Mr. Scott and all of you working with these programs will be contacting us and we want to hear from you other people. All of your suggestions will be welcomed and beneficial to us.

LT. COLONEL BETTS: That completes the number of people who indicated on the slips that they signed they would like to make statements. Are there any others present who would like to make a specific statement?

UNKNOWN: I'd like to ask a question of Mr. Heard.

LT. COLONEL BETTS: Yes, sir. Would you please identify yourself?

MR. HAMER: I'm Charles Hamer of Kilmichael, Mississippi.

Mr. Heard, you indicated on the small map various watershed areas that were under planning and some in operation - approximately on the map - looks like one of those would be Mulberry. That watershed is inactive at the present time. I will quote you some figures on it and ask you if they will be the cost figures on it. They had approximately \$328,000 worth of improvements - they said work to be improved on. The cost would be \$11,483 per year. It would count 3 1/2% or 35 mills on the improvement. The improvements were included on - Mr. Scott, don't shake your head - I got these off the photostatic copies over at the Chancery Clerk's office. Three and one-half percent of the total improvements per year or 35 mills. That was going to be on 8,000 acres, or a little bit better than 8,000 acres. On these small watershed programs going into Big Black, would they continue that type of policy?

MR. HEARD: I can't confirm any estimate on the cost of any project, not even Mulberry. I can say this about Mulberry. This question of cost did come up. There was some misunderstanding and some confusion and I have, at the request of the Commissioners of Mulberry District and with their concurrence, set Mulberry aside until these disconcerting questions have been straightened out by the people within the district. Now as far as the details of the cost, I don't know.

MR. HAMER: These figures were copied off the thing in the Chancery Clerk's office.

MR. HEARD: You can well understand that I wouldn't know, but there has been some confusion and you can be assured there won't be another nickel spent until Mulberry Creek is straightened out.

MR. HAMER: They won't have any cost at all?

MR. HEARD: They won't have any kind of cost until the commissioners and the landowners get together on the cost they are willing to put into it.

LT. COLONEL BETTS: Are there any other questions or statements from the group?

MR. NEILL: I am W. C. Neill, North Carrollton, Mississippi. It may be that I can make a few statements that will clarify some of the objections that have been raised to this proposed program.

With reference to loss of population, it has been my observation as a person very much concerned with that loss, by reason of the fact I am engaged in the banking business rather extensively, that the reason for that loss of population was the erosion and destruction of land on which those people made their \$2,500 or less living during the time that the land was eroding.

Now with reference to pine trees - it has also been my observation that these trees, that is 95% of them, have been planted on this eroded land that the people moved from and if those trees were moved from this 95%, the land would go back to its state of erosion that existed when the CCC Camp was established here, and the work they did then and continuance of that work has stabilized a large part of that area.

Now with reference to the amount of land taken out of cultivation by reason of these small watershed dams, one creek which debouches into the Delta and into the Yazoo River in the area west of here is Pelucia Creek. On that creek there have been established and are under construction 12 of these water retention dams which impound, I would say, possibly 300 acres of water permanently. My observation in respect to that construction has been that of that 300 acres there wasn't over 25 or 30 that were in useful production before that construction commenced.

It has been my further observation that with reference to the flood control phase, where the water rises from the permanent pool up to the point where it debouches over the emergency spillway, an area approximately - correct me on this, Bill, twice the number of acres in the permanent impoundment - approximate.

MR. HEARD: May be a little more than that.

MR. NEILL: Now my observation on that situation is, while it is out of business for row crops and cultivation, its character and value as pasture land has improved by reason of the fact that there is fall inundation and the sediment that it brings with it increases the fertility of that area. In addition to that, those little lakes are pretty and with reference to the expanding population, a great many people out of the \$2,500 bracket need to get out in the country and have them a beautiful place for a home, or for recreation purposes. I can recall two instances where people were going to be ruined by that kind of a situation. I will cite them to you. One boy who had an 80-acre farm on the Big Sand Creek Watershed had very grave objections to the use of his land for that purpose and condemnation was necessary under the laws which exist and his land was taken and he was paid for that and he had the remaining 60 acres that were not as good as this bottom land - it was flooded - but some individuals looked over that area where they could look down on that lake and offered him twice as much for the remaining 60 acres as he had paid for the 80 acres. He agreed that he was going to make the sale, but his wife had to sign the deed, and during the consideration of the matter, and in talking it over with mama, he came to the conclusion that he thought more of his remaining 60 acres than he did at first, especially in view of the fact that mama wouldn't sign the deed - why "no sale."

The second incident of that nature was where a colored family represented by my good friend Mack Boykin here was going to be ruined. Now it develops that there's a nice site for recreational purposes that can be available, if a sale can be arranged, in a very great excess of the amount at which the appraisers who functioned at that condemnation procedure appraised the value of that land. Now that's the outlay of this thing from an observer whose financial interests are such that the improvement of the area will go down to his benefit in the records and those are the facts that I have observed and they may be of some use to you or they may not. So, take them for what they're worth. Thank you, Colonel.

LT. COLONEL BETTS: Thank you.

Are there any other statements?

MR. WADE: I'd like an answer to the question I asked a while ago. Have you completed your study? When can we expect some action and where do we go from here? There's some mighty good land down on Hays Creek. We would like to project our thinking on utilizing that land in the future. The main thing I want to know is, when will this project get rolling?

LT. COLONEL BETTS: First of all, let me apologize if I didn't answer your question originally, sir.

To make sure that you understand it - we have not made the study - we are going to make the study. The purpose of this hearing is to come to the people to make sure that we get the full opportunity, from every source, to find out what the needs for water utilization are now and what the projected needs of water utilization are. This will be beneficial to us and when I say us, I mean all the agencies involved in permitting us to have as much material before us as possible at the time we do make the study. We are getting ready to get underway with the study. We do not have any solution to present to you at this time. The study, we hope, will provide an adequate solution to do the job and also one which will be in best interest of all the people.

At this particular point I would like to add the fact, we were talking about cost a little while ago, as various features are developed, and they are not developed now, the local participation in the construction and making available of lands and various things that go into these features will be thoroughly coordinated with the local people and agreement reached at that level to the maximum extent possible before any spade of earth is turned.

UNKNOWN: Let me ask one question.

LT. COLONEL BETTS: Will you identify yourself, please.

MR. BAGWELL: Some parts of the individual drainage districts on the tributaries of Big Black can be organized and set up and retention dams built before your studies on this whole Big Black Watershed are completed. Is that right?

LT. COLONEL BETTS: Mr. Heard, do you want to tackle that?

MR. HEARD: One or two questions, folks, that have gotten under consideration here today, I think, need to be clarified. First of all, there are two items under consideration here now apparently at this time. Our original discussion, as the Colonel stated, dealt with the proposition of making an overall plan, study and plan, of the entire basin with an idea that at some future date there might be authority that would facilitate and accelerate some of the activities that are needed to be carried out in this basin. This might affect Soil Conservation Service, or the Corps or any of the other groups that have been mentioned here. Let's let that stand right at that point and talk about the other question just for a moment because the question of Mulberry Creek and Hays Creek has now gotten into the picture, and the question of the gentlemen from Choctaw is somewhat along the same line, but not exactly. I would like to summarize the situation on these first two. First of all, there was a group of landowners on Mulberry Creek banded themselves together and made application to the SCS and the State Soil Conservation Committee for a watershed plan on Mulberry Creek. They were assigned a priority by the State Committee, and in accordance with this priority a plan was prepared in this area by the landowners, or by representatives of the landowners, with the guidance and assistance of a work unit party under my supervision and that is the SCS. Following the completion of this plan, and with some of the attendant publicity required by law, there came some questions about some of the features of the plan as well as the cost of the plan and this debate became rather sharp, and if my information is correct, somewhat bitter. We, in the meantime, had initiated some work in the land features phase of this program and when it became apparent that the people had not really given their wholehearted support to this project, we recommended to the commissioners of this district that this project be put on a suspended list. They concurred in this and I have officially suspended this project from further operation, but I will say this, at any time their commissioners or the people in that area want consultation from me, or any of my staff's assistance, with respect to the needs of this area, it will be available and we will be more than happy once there has been reconsideration or adjustment of the terms of the plan. We will be more than happy to reopen this project for operation but keeping in mind that local interests have to defray the cost of the land, the easement rights-of-way and assure maintenance of the structures.

Now then, with respect to Hays Creek, a similar course of action was followed on Hays Creek. The landowners decided they

needed some help, they banded themselves together and made an application in the same way as required by law. The application was duly considered and was received by the State Committee. My recollection is that a priority was assigned, but again because of misunderstanding and the lack of cohesive interest on the part of the people in that area, we have set aside the planning priority for Hays Creek. It will not be planned until the people say that they really feel like they need some help and are willing to work together and provide the necessary participation on their part, because this is a local project in which the SCS provides technical assistance in the plan. The plan has to represent the decision of the Commissioners of the Water Management or Drainage District and has to be in accordance with the wishes of the people, as prescribed by the laws of the State of Mississippi, and if and when the landowners and the commissioners in that area want to reopen this project, we will be glad to help them do so, but until the uncertainty that exists there now has been removed, Hays Creek is just as dead as it can be. I hope that some day it will be reopened, but when it's reopened we'll want the people to be ready to back it up and go ahead and get something done.

Now with respect to your question, the same sort of thing can be done, of course, in any watershed of less than 250,000 acres. This would apply to your county. Request could be made to the State Committee and to me. It has to be approved and it has to meet certain requirements. It has to be approved by the State Committee and then, on the basis of the nature of the problems, interest, witness of the people, then they would set up a priority and at some future date planning assistance would be made available through a legally constituted body, drainage district, and then once this plan has been completed and necessary technical approval given, then financial assistance can be made available. It depends on the interest, the willingness, and the ability of the people to make up their minds what they want to do as to what we do.

MR. BOYKIN: My name is Mack Boykin, Mr. Heard. I want to ask - the Commissioners of the Peachahala Water Management District are here - and we just would like to have some information as to the progress that has been made through your office down there as to it, if you could give us some information.

MR. HEARD: Mr. Burford, could you reinforce me on the status of Peachahala?

MR. BURFORD: The first step would be for the commissioners to try to get a priority. We have the application but the State Committee will want a statement that you will get the easements, rights-of-way, financial capability, etc.

MR. BOYKIN: Thank you, sir.

LT. COLONEL BETTS: Any other statements? If not, we will now terminate this public hearing and I'd like to say in doing so - I thank you for coming out today. We appreciate it. We appreciate the opportunity of being here.

In coming up from Vicksburg today we took the opportunity to fly in a light aircraft and we flew the entire Big Black Basin, and I can assure you of one thing, I learned a whole lot more seeing it low from the air than I can driving through criss-crossing in an automobile.

It's been a pleasure, ladies and gentlemen. We thank you.

A letter-statement from Mr. B. G. Harper, Alderman from the Town of Kilmichael, was handed in at the hearing with the request that it be made a part of the official record of the public hearing. (Exhibit E)

EXHIBIT A

U. S. ARMY ENGINEER DISTRICT, VICKSBURG
CORPS OF ENGINEERS
P. O. BOX 60
VICKSBURG, MISSISSIPPI

9 October 1964

NOTICE OF PUBLIC HEARING

BIG BLACK RIVER, MISSISSIPPI
COMPREHENSIVE BASIN STUDY

The Vicksburg District Corps of Engineers and other Federal and State agencies are making a comprehensive study of the Big Black River Basin in response to the following Congressional resolutions:

"Resolved by the Committee on Public Works of the House of Representatives, United States, That the Board of Engineers for Rivers and Harbors be, and is hereby, requested to review the reports on Big Black River, Mississippi, submitted in House Document No. 72, 73rd Congress, 1st Session, with a view to determining whether the recommendations contained therein should be modified in any way at this time, particularly with reference to the tributaries of the Big Black River."

"Resolved by the Committee on Public Works of the House of Representatives, United States, That the Board of Engineers for Rivers and Harbors be, and is hereby, requested to review the reports on Big Black River, Mississippi, published in House Document 72, 73d Congress, with a view to determining whether the existing project should be modified in any way at this time in the interest of flood control and allied purposes."

The purpose of this comprehensive study is to develop a logical plan for the development of the water resources in the basin to satisfy the water and water-related needs in the area for the next 50 years. The investigation is described more fully in the inclosure to this notice.

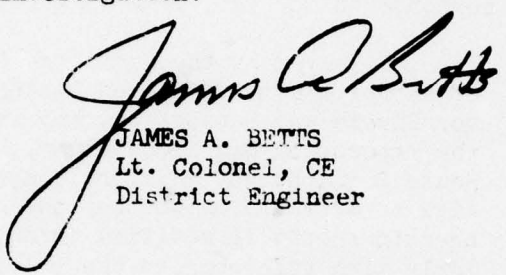
The Vicksburg District, as the Field Leader for this study, will hold public hearings at the Court House in Winona, Miss., at 2:00 p.m. on Wednesday, 4 November 1964, and at the Court House in Canton, Miss., at 2:30 p.m. on Thursday, 5 November 1964. These meetings will be similar in that the material presented by the Corps of Engineers and other agencies will be essentially the same. They will afford the people in each area an opportunity to express their views regarding the need for water resources development and to provide information on any specific projects that they desire or oppose.

Therefore, I invite all interested persons to be present at either of the meetings mentioned above. They will be given full opportunity to express their views concerning the character and extent of the water needs, and the improvements desired. Proponents of any specific improvementment are urged to present pertinent factual material bearing upon the general plan of improvement desired. Opponents to any particular type of improvement in the basin are also urged to state the reasons for their position.

Oral statements will be welcomed at these hearings; however, for record purposes proponents and opponents of any particular type of water resources development should submit their arguments in writing.

Please bring the foregoing to the attention of persons known to you to be interested in this investigation.

1 Incl
Information Sheet



JAMES A. BETTS
Lt. Colonel, CE
District Engineer

EXHIBIT B



**UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
PEACHTREE-SEVENTH BUILDING
ATLANTA, GEORGIA 30323**

November 2, 1964

District Engineer
U. S. Army, Corps of Engineers
P. O. Box 60
Vicksburg, Mississippi 39181

Dear Sir:

Reference is made to your notice of public hearings, dated October 9, relative to the comprehensive basin study, Big Black River, Mississippi, being made in compliance with resolutions of the Committee on Public Works, House of Representatives, United States Congress.

We appreciate the opportunity to participate in this hearing and have asked our Vicksburg office representative to make this statement in behalf of the Bureau of Sport Fisheries and Wildlife.

Our participation in this comprehensive study will be in accord with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), and in cooperation with the Mississippi Game and Fish Commission.

The Bureau of Sport Fisheries and Wildlife will inventory fish and wildlife resources existing in the Big Black River Basin and estimate the present and future level of sport hunting and fishing and commercial fisheries harvest. The capacity of the lands and waters of the basin to produce fish and wildlife will be appraised in order to determine the ability of the environment to meet future hunting and fishing demands. These studies will permit a determination of fish and wildlife shortages which may occur and the developments required to conserve or increase the resources which will be needed by hunters and fishermen. The Bureau of Sport Fisheries and Wildlife will report on features of the comprehensive plan and make recommendations as required to maintain or develop fish and wildlife resources at a level commensurate with future needs.

The opportunity to present this statement is appreciated.

Sincerely yours,

Walter A. Gresh
Regional Director

EXHIBIT B

EXHIBIT C

Statement
of
GORDON E. STONE
Sanitary Engineer Director
U.S. Public Health Service
Department of Health, Education & Welfare
Jackson, Mississippi

for the

Public Hearings of the U. S. Army Corps of Engineers
on the
Comprehensive Study of the Big Black River Basin, Mississippi
Vicksburg, Mississippi

September 1964

I am Gordon E. Stone, Sanitary Engineer ~~Director~~ of the United States Public Health Service in the Department of Health, Education and Welfare. I am Officer-in-Charge of the Jackson, Mississippi Field Office of the Southeastern Comprehensive Water Pollution Control Project of the Division of Water Supply and Pollution Control of U.S.P.H.S. The Southeastern Comprehensive Water Pollution Control Project, as authorized by the Congress in Section 2 of Public Law 660, is engaged in a long-range study of all factors of water quality now affecting, or which predictably can affect, the legitimate uses of waters within the study area. When this study reaches the report stage, it will be possible to predict for any stream within the study area the effect of any present or proposed discharge of polluting material on the downstream water uses. This will permit Federal, State, and local officials and businessmen to plan intelligently for adequate pollution control and to adopt sound policies to implement such plans.

Concurrently with our own comprehensive study, we are participating as a cooperating member in the comprehensive river basins studies being made by the various Federal agencies concerned with the development and use of water

EXHIBIT C

resources in which one of the other agencies serves as principal investigator and coordinator. Such is the case with the comprehensive study of the Big Black River in Mississippi.

Our immediate study will provide the following information:

- (1) the present quality of water in the Big Black River Basin;
- (2) the effects of the present quality on present uses;
- (3) the required quality for possible future uses;
- (4) the feasible alternatives by which the required quality can be achieved.

These data will then be used by the Corps of Engineers to determine the structural measures required for flow regulation within the next ten to fifty years to achieve the quality recommended. Our study likewise will evaluate the effects on water quality of structural measures proposed by the Corps of Engineers, other Federal agencies or by non-federal agencies where known. It will recommend modifications which will improve the potential of such structures for water quality benefits or which will reduce incidental damages to water quality which may otherwise result.

The present study by the U. S. Public Health Service includes an inventory of existing sources of pollution and determination, by analysis of samples from the river and its tributaries, of the chemical, bio-chemical, bacteriological and biological characteristics of the water.

The same data obtained as a basis for recommendations required by the Corps of Engineers for their comprehensive study will also become a part of the data which our Southeastern Comprehensive Water Pollution Control Project will require in the development of a long-range water pollution control plan. It is the goal of the U. S. Public Health Service to so develop and

store data on the characteristics of the basins that requirements for water treatment or flow augmentation may be readily determined for any desired water quality criteria and proposed pollution load. These data are to be kept current with periodic review of the pollution control plan in order that they may be of maximum benefit to the using agency or entity whether it be Federal, State, municipal or private.

These studies will require the cooperation and assistance of all of the Federal, State and local agencies concerned with water resource development. The U. S. Geological Survey and the Mississippi Geological Survey are furnishing data on water availability and flow characteristics; the Mississippi State Board of Health is contributing laboratory space and equipment and performing a portion of the laboratory determinations; the Mississippi Water Board, the Mississippi Game and Fish Commission, the State Board of Health and the State Oil and Gas Board are all furnishing data on possible sources of pollution. ^{We are arranging with} the Mississippi Game and Fish Commission ~~is further cooperat-~~ ^{to make} ~~ing by making~~ biological studies of the streams. ^{payment to an entity.}

The uses to be made of the waters are largely a local determination. Having learned the characteristics of the streams and the regulation, by means of structures, proposed by the Corps of Engineers, the Federal Power Commission, the Soil Conservation Service or non-federal agencies, the Public Health Service will show the quality needed for each of the possible uses. The alternative to be selected will be a local determination with assistance from State and Federal agencies.

The studies are designed to develop a comprehensive water pollution control program which will provide for all present and future water needs and uses in the entire river basin in which water quality plays a role. The

objective sought is the preservation or improvement of the quality of the waters of the basin in such a way as to insure continuing optimum benefit from them for the basin as a whole, at minimum economic cost.

EXHIBIT D

Soil Conservation District
Montgomery County
Winona, Miss.

November 4, 1964

U. S. Army Engineer District
Corps of Engineers
P. O. Box 60
Vicksburg, Mississippi

ATTENTION: James A. Betts, Lt. Colonel, CE, District Engineer

Dear Sir:

Reference is called to the Public Hearing, Big Black River, Mississippi, Comprehensive Basin Study.

We, the Commissioners of the Montgomery County Soil Conservation District, favor the development of a long-time comprehensive plan to guide the development of this major watershed of the state of Mississippi. There exists no organized or planned effort to develop the area.

Our experience with project type action to solve soil erosion and water management problems in the Yazoo River Watershed has taught us that project type action is effective in applying conservation measures to a watershed. For this reason, we believe that the same principles applied to the planning and development of the Big Black River Watershed will solve our present and future problems in this watershed.

Two thirds of Montgomery County lies in the Big Black River Watershed. Within this area there are eleven small watersheds and parts of small watersheds needing project type action to solve their problems.

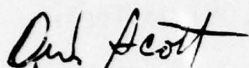
The Montgomery County Soil Conservation District has farmer district cooperative agreements with approximately seven hundred land owners in this watershed, and the problem of adequate drainage is universal. This lack of drainage is allowing the bottom land to become water logged and to produce reduced yields, or to become idle.

Drainage is only one example of a problem that must be solved by project type action. All of the present and future water and water related needs can best be met by the development of a long-time plan. There is a need for flood prevention and control. There is also a need for water for recreation, water supply for industrial and municipal demands, navigation, supplemental water for pollution abatement, storage for hydroelectric power, irrigation, and fish and wildlife conservation. There is great potential for development of the water resources of the basin for these purposes.

Since the formation of the Soil Conservation District in 1941, we have worked with all Governmental agencies and private interests for the development of the County's agricultural and industrial potential. We have worked with the Montgomery County Development Association and the Winona - Montgomery County Chamber of Commerce.

We urge all agencies and interests to work together for the development of Big Black River Basin to meet present and future water and water related needs. In this way soil and water conservation will be greatly advanced.

For Montgomery County Soil Conservation District Commissioners:


O. W. Scott

President, Montgomery County Soil Conservation District Commissioners
Winona, Mississippi

EXHIBIT E

BOARD OF ALDERMEN
B. G. HARPER
LAGRONE MORTIMER
S. L. CAMERON
E. L. GATLIN
JAMES MONTGOMERY

TOWN OF KILMICHAEL
KILMICHAEL, MISS.

MAYOR
JOHN FLOYD
MARSHALL
J. S. MOORE
TOWN CLERK
Y. M. LOTT, JR.

November 4, 1964

U.S. Army Engineer District, Vicksburg
Corps of Engineers
P.O. Box 60
Vicksburg, Miss.

Dear Sir :

We have been in Dry Goods business in Kilnichael, Montgomery County, Miss. for the past ten years. Every year our farmer friends along the Big Black River Basin come in the store and complain of their crops and pastures being ruined because of flooding waters over-flowing their land.

The flooding is also causing great menance to land owners along tributaries to the Big Black River, --Poplar creek, hays creek, Lewis creek, mulberry creek, and wolf creek.

News have gotten out in the area that the U.S. Engineers and the Mississippi State Department are interested in helping land owners eliviate damages to their crops and farms , and this project is bringing satisfaction to the entire populas of the Big Black River Basin.

You will find the people as a whole cooperative to this project and willing to assist in its much needed purpose.

Yours very truly ,

B. G. Harper
B.G. Harper Dry Goods Store

EXHIBIT E

TRANSCRIPT OF PUBLIC HEARING

ON

BIG BLACK RIVER, MISSISSIPPI

COMPREHENSIVE BASIN STUDY

MADISON COUNTY COURTHOUSE

CANTON, MISSISSIPPI

5 NOVEMBER 1964

U. S. ARMY ENGINEER DISTRICT, VICKSBURG
CORPS OF ENGINEERS
Vicksburg, Mississippi

Public Hearing
on
Big Black River, Mississippi
Comprehensive Basin Study

Madison County Courthouse
Canton, Mississippi
5 November 1964

The U. S. Army Engineer District, Vicksburg, held a public hearing in Canton, Mississippi, to discuss the comprehensive study on the Big Black River. Lt. Colonel James A. Betts, District Engineer, called the hearing to order at 1430 hours.

PRESENT:

VICKSBURG DISTRICT, CE

Lt. Colonel James A. Betts, District Engineer
Mr. Russell K. Stewart, Chief, Basin Planning Branch
Mr. DeKalb Wylie, Basin Planning Branch
Mr. Fred Bayley, III, Chief, Big Black Study Section
Mrs. Bertie A. Davidson, Stenographer
Mrs. Patty Kay French, Stenographer

PRESENT ALSO:

Mr. John R. Anderson, Cattle Business, Flora, Miss.
Mr. Raymond J. Anton, Golden Eagle Ranch, Owner, Rt. 1, Box 149
Canton, Miss.
Mr. W. E. Barksdale, Central Miss. Development District Manager,
P. O. Box 1038, Canton, Miss.
Mr. Eric Biedenharn, Farmer - Owner, Rt. 5, Vicksburg, Miss.
Mr. Dan Bottrell, L&D Farms, Inc., Farmer, Flora, Miss.
Mr. F. E. Brasfield, Rivers and Harbors Association of Miss., Director,
Edwards, Miss.
Mr. C. L. Buford, SCS Commission, Farmer, Edwards, Miss.
Mr. S. R. Cain, Jr., Madison Land & Development Company, Vice-President,
Box 286, Canton, Miss.
Mr. A. P. Carroll, Soil Conservation Service, Work Unit, Lexington, Miss.
Mr. Nelson Cauthen, Lawyer, Canton, Miss.
Mr. Donald Colmer, Miss. Power and Light Co., Assistant to President,
Jackson, Miss.
Mr. R. M. Costello, Farmer, Flora, Miss.
Mr. Ben A. Davis, Jr., Miss. Forestry Assoc. Exec. Vice-Pres., 447 King
Edward Hotel, Jackson, Miss.

PRESENT ALSO:

Miss Claire Davis, Rivers & Harbors Association of Miss., Executive Vice-President, New Capitol, Box 1309, Jackson, Miss.
Mr. F. T. Dinnean, COE, Mobile District, Planning Engineer, Mobile Alabama
Mr. Charles Donald, Farmer, Goodman, Miss.
Mr. A. H. Eaton, Supervisor, Claiborne County Port Commission, Port Gibson, Miss.
Mr. F. H. Edwards, Farmer, Canton, Miss.
Mr. R. C. Flanagan, SCS, Area Conservationist, Jackson, Miss.
Mr. Earnest Fortenberry, Noble and Fortenberry Real Estate, Canton, Miss.
Mr. David Fortgang, International Paper, Area Superintendent, Canton, Miss.
Mr. Russell Fox, Claiborne County Port Commission, State Representative Pattison, Miss.
Mr. James V. Gardner, Farmer, Canton, Miss.
Mr. J. T. Garland, Mayor, Town of Pickens, Pickens, Miss.
Mr. James D. Goodwin, SCS, Work Unit Conservationist, P. O. Box 55 Canton, Miss.
Mr. L. J. Hancock, Soil Conservation District, Farmer, Bentonia, Miss.
Mr. C. L. Hardy, Farmer, Flora, Miss.
Mr. Richard G. Hastings, Claiborne County Port Commission, President, Mississippi Southern Bank, Port Gibson, Miss.
Mr. Wiley H. Hatcher, Ranger, Port Gibson, Miss.
Dr. F. S. Headley, Optometrist, Box 145, Port Gibson, Miss.
Mr. W. L. Heard, Soil Conservation Service, Jackson, Miss.
Mr. Wyndal L. Hendricks, Soil Conservation Service, Acting Work Unit Conservationist, P. O. Box 295, Canton, Miss.
Mr. Leon Henry, Farmer, Route 3, Box 93, Vicksburg, Miss.
Mr. Horace C. Holmes, Mississippi Board of Water Comm., Summit, Miss.
Mr. E. E. Del Homme, COE, Mobile District, Civil Engineer, Mobile, Ala.
Mr. S. M. Hubbard, Member Board of Supervisors, Hinds, Co., Utica, Miss.
Mr. P. L. Hughes, Soil District Commissioner, Rt. 1, Madison, Miss.
Mr. Henry Jones, SCS Commission, Warren County, Farmer, Route 3, Box 96, Vicksburg, Miss.
Mr. N. W. Kyle, Hotel Manager and Farmer, Durant, Miss.
Mr. Arthur L. Land, Pulpwood Dealer, Durant, Miss.
Mr. C. Henry Lee, Farmer, Jackson, Miss.
Mr. Horace B. Lester, Hinds County, Representative, Jackson, Miss.
Mr. B. H. Maxwell, Sr., Farmer, Pickens, Miss.
Mr. E. A. McCaa, Claiborne County Port Commission, Farmer, Port Gibson, Miss.
Mr. L. H. McMullen, Ginner, Farmer, Canton, Miss.
Mr. L. S. Matthews, City of Canton, Mayor, City Hall, Canton, Miss.
Mr. J. J. Millsaps, Claiborne County Port Commission, Farmer, Hermanville, Miss.
Mr. R. L. Moss, Leake County Supervisor, Lena, Miss.
Mr. E. O. Peterson, Farmer, Goodman, Miss.
Mr. Fred G. Peyton, Board of Supervisors, Claiborne County, Rt. 2, Utica, Miss.

PRESENT ALSO:

Mr. R. W. Phillips, Farmer, Flora, Miss.
Mr. B. E. Presley, Farmer, Pickens, Miss.
Mr. George D. Scruggs, Bureau of Sport Fisheries and Wildlife, Fishery Biologist, 817 Crawford Street, Vicksburg, Miss.
Mr. J. F. Sheffield, Voc. Agri., Teacher of Voc. Agriculture, Bentonla, Miss.
Mr. J. K. Simpson, Farmer, Pickens, Miss.
Mr. R. L. Smith, Extension Service, County Agent, Canton, Miss.
Mr. Pat Southall, Farmer, Rt. 3, Box 49, Vicksburg, Miss.
Mr. E. P. Spencer, Claiborne County Port Commission, Port Gibson, Miss.
Mr. Davis N. Starnes, Board of Supervisors, Port Gibson, Miss.
Mr. J. E. Stevens, SCS, Work Unit Conservationist, Box 455, Port Gibson, Miss.
Mr. Edmond I. Swensen, U. S. Forest Service, Forester, P. O. Box 3319, Jackson, Miss.
Mr. A. R. Tillman, First National Bank, Senior Vice-President, Jackson, Miss.
Mr. C. L. Tullos, Soil Conservation Service, Work Unit Conservationist, P. O. Box 910, Vicksburg, Miss.
Mr. W. J. Waits, Farmer, Goodman, Miss.
Mr. Gene Walker, Farmer, Rt. 1, Madison, Miss.
Mr. J. R. Wallace, Farmer, Rt. 4, Box 75, Canton, Miss.
Mr. Malcolm N. Warren, Hinds County Board of Supervisors, Supervisor, 2nd District, Bolton, Miss.
Mr. Gil Watson, Madison Livestock, Vice-President and Manager, P. O. Box 128, Flora, Miss.
Mr. H. P. Watson, Farmer, Lexington, Miss.
Mr. Gerome D. Wynne, Sr., Tackett Creek Water Shed, Farmer, Pickens, Miss.

LT. COLONEL BETTS: Good afternoon, ladies and gentlemen. I would like to open this public hearing at this time. I'm Lt. Col. James A. Betts, District Engineer, Vicksburg Engineer District, Corps of Engineers. The Department of the Army, Corps of Engineers, has been designated as the Field Leader for this comprehensive study of the Big Black Basin for the purpose of developing a plan to meet all the water needs now and in the future in this basin. Rather than the normal type of public hearing, I would like to think of this one as more informational in nature, really, to let you know where we are, where we're going, and what we're going to do. This study is to be truly comprehensive in nature, and to make sure that it is comprehensive, all of the Federal and State agencies who have any experience in water resource development will participate and take part in this study. To make sure that it is well guided, we have a Coordinating Committee set up, of which I am the Chairman. This committee consists of myself, a representative of the Governor, and representatives of the various Federal agencies, who are interested in this study. I'd like to introduce several members of this Committee who are present today.

First of all, Mr. Sam Hailey, who represents the Governor of the State of Mississippi, Mr. Hailey.

Next, Mr. W. L. Heard, State Conservationist for the Soil Conservation Service, representing the Department of Agriculture. He will also make a presentation later.

The other members of this Committee who are not present today are:

Mr. Herbert H. Rogers, from the Department of Health, Education, and Welfare, headquarters in Atlanta.

Mr. Lenard Young, Federal Power Commission, offices in Fort Worth, Texas.

Mr. R. J. MacConnell, Department of Commerce, also from Fort Worth, Texas.

Mr. Kenneth D. McCall, Department of Interior, Muskogee, Oklahoma.

There are two other gentlemen present today, who I would like to introduce at this time, who will be active participants in this study.

First of all, Mr. Scruggs, who is with the Vicksburg office of the Fish and Wildlife Service. They will conduct their portion of the Big Black studies.

Also, Mr. Gordon Stone, Public Health Service of the Department of Health, Education, and Welfare, who directs their field investigations on the Big Black River; these gentlemen will also make a statement later.

We have some other distinguished guests in our audience who I would like to introduce at this time. Looking around, I see Miss Claire Davis who is the Executive Vice President of the Mississippi Rivers and Harbors Association.

Anyone I've missed here now who would like to be introduced at this time?

I'd like, at this time, to introduce the members of the District Engineer's staff who are present here with me.

First of all, Mr. Russell K. Stewart, who is the Chief of Basin Planning Branch, Engineering Division.

Mr. Fred Bayley, III, who is the Chief of our Big Black Study Section. He is the gentleman who will be responsible for the investigations in the Vicksburg District on the Big Black River, and the gentleman you may want to contact from time to time.

Also, we have with us, Mr. Dekalb Wylie of the Basin Planning Branch.

The young ladies who will record this hearing - Mrs. Bertie Davidson and Mrs. Patty Kay French.

I'd like at this time to ask Mr. Heard to introduce representatives of the Department of Agriculture who might be present.

MR. HEARD: Under this staff we have the function of the U. S. Forest Service. We have several of our county work unit conservationists: Mr. Goodwin, Yazoo County; Mr. Tullos, Warren; Mr. Hendricks, Madison; Mr. Carroll, Holmes; Mr. Stevens, Claiborne County. They're all Work Unit Conservationists. Also, a long time friend, Buddy Smith, County Agent, Madison County.

LT. COLONEL BETTS: Thank you, Mr. Heard.

On your arrival, the young lady in the rear was handing out little slips on which you could sign your name, who you represented, and whether or not you wished to make a statement. Has everyone gotten one of those? If you haven't, please hold up your hand and Mrs. French will pass you one.

This public hearing is being conducted in accordance with the public notice which the Vicksburg District issued on 9 October 1964. This notice was posted in conspicuous places throughout the Big Black Basin and has been widely distributed to all individuals we knew who were specifically interested in this study. For the purpose of the record, I would like to have Mr. Bayley now read this notice. I will ask him to omit the reading of the inclosures as we will go further into that matter a little later in the hearing. Mr. Bayley.

MR. BAYLEY: Reads notice of public hearing - Exhibit A.

LT. COLONEL BETTS: Thank you, Fred.

I would like to stress the point at this particular time, that the meetings are being held at these two locations - yesterday at Winona and today in Canton - strictly for the convenience of the local people. The matter presented is identical, the only difference being probably the presentations made by local people.

As I said, we referred to this as a public hearing though I really like to look at it as an informational meeting. As you know, the normal public hearing takes place on initiation of investigations directed by Congress and at this time local interests have usually developed a plan for the special project that they believe that they need. The public hearing gives them an opportunity to present their proposal and to speak as they desire, either for or against it. In the case of a comprehensive basin study, we have no features at this particular time; we have no plans, we're ready to develop one, and the first thing we need to know is to develop what are the needs; what do the people want, and what don't they want. We try to look not only at the needs today, but also into the future. The study, we hope, will be a very fine presentation of what the

needs are and the ways in which these needs can be met, and I solicit your assistance in helping us to know what your views are and what the needs are. This will help us develop the plan and particularly help us investigate the possibility of meeting those needs. We will first describe the procedures and objectives of the investigations, then I would like to show you a film that I brought along on the Comprehensive Basin Planning on the Potomac River, because I believe it will help you better understand what a comprehensive plan is.

By water needs I refer to such things as flood protection, water storage for power, recreation, water supply, pollution abatement, land treatment measures, and the features to enhance fish and wildlife characteristics. Of course, you may feel free to speak either for or against reservoirs, levees, or any type of feature that you think should, or should not be, considered in the plan. In the public notice we specifically asked for written statements; however, please don't let that fact inhibit you making such statements as you so desire. We encourage you to make all statements here you want. I would like to stress the fact that this is not just a plan being developed by the Corps. This is a cooperative effort, a joint effort, really, by all Federal and State agencies, and taking very definitely into account the desires and wants of the local people. The plan that we will prepare in coordination with all these agencies, we hope, will determine the needs and develop a plan of improvement to satisfy the water needs of this basin for 50 years. Of course, we will have to include therein the economic justification, therefore. It is also our goal in our plan and in our report we submit, to include sufficient detail to provide or to permit Congress to consider authorization of those projects that are needed in the next 10 to 15 years. As in the case of all other projects, of course, the authorization and appropriation of funds for the construction of any recommended projects would depend upon the approval and support of the local people.

At this time I would like to call on Mr. Bayley again to give you a more detailed description of the studies that we intend to make. Now I want to make the point, we have not made the studies. We are getting ready to make them. I would like for Mr. Bayley to include a brief synopsis of the participation of the other agencies that are involved. Of course, then I will call on representatives of these other agencies to discuss their participation in the study. Mr. Bayley.

MR. BAYLEY: As the Colonel has told you, the purpose of this meeting today is to let you know that we are making a comprehensive study to see what projects will be needed in this basin in the next 50 years and to find out what things you think should be included in our investigation. As I discuss the comprehensive study in a little more detail, there are several things that I hope you will get from my remarks.

First, we want you to see what water needs are normally considered in comprehensive studies and how they are related to each other. Also, you will note the agencies that are involved in this investigation and what their roles are, and get some idea of what type of project could be included in the plan developed. I stress the point that any project recommended by us would always be subject to final say-so of the Congress and thus you, the people

so that no plan or project is ever constructed unless the majority of the people are in favor of it.

I would like to enumerate some of the things that such a plan should provide or take care of.

1. Adequate supply of water for human consumption, for agriculture, and for industrial purposes.
2. Insure that this water is of suitable quality to satisfy any use you would like to put it to.
3. To provide water navigation facilities, if these facilities would serve to improve the overall transportation system of the nation.
4. To give us flood control or prevention measures to protect the people and their property including productive lands.
5. Land stabilization measures.
6. Drainage works to insure the best use of our available land.
7. Watershed protection and management measures.
8. Outdoor recreation and fish and wildlife opportunities where these can be enhanced by improvements.

While we are considering the means and the projects that we can use to develop our resources, we must maintain a proper stewardship of these resources. By this we mean that in some instances, open spaces, rivers, and lakes should be left in their natural state to serve the best interest of you people here in the basin. It might also mean that we should preserve and protect some areas of historical and scientific interest for the education and enjoyment of the people in the future. Throughout the study, we try to be sure that the interest of all the people is the overriding determinant and thus be sure that we avoid the development of resources for the benefit of a few or the disadvantage of many.

The Big Black River Basin that we will cover in our plan of water resource development for the next 50 years is shown on the map, as you see, here in the front of the room. It is outlined in red. The basin itself is comprised of about 3,400 square miles, about 155 miles long and 22 miles in width. It includes parts of these 11 counties:

Webster, Carroll, Warren, Attala, Madison, Hinds, Holmes, Montgomery, Yazoo, Choctaw, and Claiborne, and just a little tip of Leake and Oktibbeha, but in no case does it its entirety. Our considerations in this study are not limited to the main stem or the valley section of the basin, but they extend to the drainage divide on the high ground that separates the Big Black from the Yazoo along the north and west and the Pearl River on the south and the east.

As you are well aware, there are many tributaries that enter the Big Black at fairly even intervals throughout its length that probably contribute more to the economy of the basin than the parent stream itself does. Certainly, the economy is geared primarily to agriculture, and as a result of changes in agricultural practices and other influences in the basin, there has been a decline in population in recent years, and it would now be considered rather sparsely populated.

The first step of our investigation is to determine the actual needs for such things as water supply, flood control, land treatment measures, and so forth, for the present, and then project these requirements for the next 50 years. We need to know the location in the basin in which these needs will exist. We just mentioned the fact that the population is now, and has been for some 20 years, on a decline. Naturally, the future number of inhabitants that we have in the basin is going to have a great deal of influence on the water needs in the state. This points out the fact that we need to know what the projection of population, etc., might be before we start projecting such things as water supply and flood control. In order to provide this information, we, along with the Mobile District, contracted with Michael Baker, Jr., Inc., consulting engineer firm in Jackson, to make what we call an Economic Base Study for the entire State of Mississippi and parts of western Alabama and Louisiana, east of the Mississippi. Michael Baker has compiled statistical data for such items as population, employment, labor force, employment by industrial classification, personal income, and the number of households. Based on these data and their knowledge of such things as a shift in population from rural to urban, farming practices and industrial expansion, they will project the population, employment, personal income, etc., over the next 50 year period. This will give us some basic guidance to use in our studies. For instance, the number of people that reside in an area is the key to the expected municipal water use. The agricultural production that we will have helps us to define the degree of flood protection we should provide, the amount of irrigation water that would be needed, and perhaps the potential tonnage for navigation improvements. Population and personal income are directly related to the water-based recreation facilities and fish and wildlife opportunities that should be provided. Employment by industry furnishes some guidance on the water supply that should be provided for industrial consumption and also influences the projected requirements for navigation and to some extent, hydroelectric power. These examples illustrate the manner in which indicators developed in the Economic Base Study will be used; however, they do not by any means cover all ways in which they will be handled. This study is now scheduled for completion sometime in December, and I believe will be presented to the general public in Jackson. You will probably see more about this in the newspapers later. I would like to stress the point, however, that this is a tool that we use in water resource development and is not considered in any way as a final or end product.

As we pointed out earlier, this investigation will pool the professional resources of most of the Federal and State agencies that are responsible for some phase of water resource development. Once the Economic Base Study is

complete, we will turn this information over to all the agencies that have participated in this study so that our plans for the future will all be based on the same anticipated growth.

I would like to tell you a little bit about the contributions of some of the agencies involved. I will not mention the work of the Department of Agriculture, the Fish and Wildlife Service, and the Public Health Service, since their representative will make a statement later.

In comprehensive basin planning, the Bureau of Outdoor Recreation is responsible for telling us the number of people that would use water-based recreation facilities. In the case of the Big Black, this visitation would come from cities or towns located well outside the drainage area. In fact, for each water need or water requirement, we will have a different area of influence. The Bureau will determine this area of influence and then estimate the total recreation requirements both now and for the next 50 years before they split out that portion that should be provided by water-based facilities.

The National Park Service will identify those areas of natural beauty that we were talking about - historical and scientific interest - that should be maintained in their present state.

The need or demand for hydroelectric power will be supplied by the Federal Power Commission with the assistance of the Southeastern Power Administration. However, normally in the first stages of the project, we consider any power needed that can be provided at a justified cost.

The Corps of Engineers will study the flood damages on the main stem along with the associated drainage needs to determine the degree of flood protection that should be included. We will also make an inventory of the potential commerce that could move on the Big Black to find out if we should give any detailed consideration to navigation projects on this stream.

Once we have amassed the total water requirements in the basin, we need to know what portion of these needs can be supplied by the natural stream flow in the existing project. A paramount interest is what is the quantity and quality of the stream flow available. We have an excellent gaging program carried on by the U. S. Geological Survey and the Corps of Engineers to give us records on the main stem over the past 30 years. In addition, the Ground Water Branch of the U. S. Geological Survey will tell us what pumpage the groundwater sources in this area could sustain.

Once we subtract our capabilities from the total demand, we can clearly see what the job remaining is. The various water needs will be grouped so that they can be associated with the projects that would answer these requirements. For example, the storage needs for municipal and industrial water supply, for flood control, power, irrigation, and pollution abatement, could all be combined so that we could see what

volume of water should be stored in reservoirs located in various sites in the basin.

In the case of flood control, of course, we would also consider channel improvement and levees, or a combination of all three.

As a first step, we will compile an inventory of all of the obviously potential projects in the basin. Generally, the projects in the upstream locations of the watershed will be compiled by the SCS and those in the lower limit will be handled by the Corps of Engineers. Then each project will be evaluated based on the benefit-cost ratio, the magnitude of the benefits that they will afford and other considerations. When we refer to a benefit-cost ratio, we are talking about analyzing a project on an annual basis to see if we get a dollar or more return for every dollar that we spend on the project. After we have made a rough analysis of the merit of each project, we will begin to build a total or several total plans. We will do this by considering the needs in the basin starting in the upstream reaches and working down. We will include the best project or perhaps projects to satisfy the need. These projects could be such things as land treatment and management measures, small reservoirs in the headwater, larger reservoirs near the mouth of the tributaries or on the main stem, channel improvements which could consist of enlarging the channel or perhaps clearing and snagging, removal of brush and logs from the channel, or perhaps, in some cases, even cutoffs; consider levees, and perhaps even locks and dams. As we develop this plan, we must consider the timing of the need. Obviously, some of the projects will be needed right now within the next 10 years. Others would be recommended for inclusion for construction at some later date, perhaps 25 to 30 years from now. We will try to give equal weight to all water resource purposes whether it be flood control or fish and wildlife enhancement, watershed protection or land stabilization, water supply, or recreation needs. In order to do this, we will try to work very closely with you, the local people in the basin, as our study progresses, and we want you to feel free to tell us what you have on your mind, and at the completion of our study we will hold additional public hearings to present the plan that we have developed and to obtain your comments and constructive criticism.

At the conclusion of the comprehensive study and after the presentation to you, the local people, we will prepare a report to present the recommended plan plus any alternative plans considered. Complete physical data plus all the improvements will be provided in the report along with the benefits and costs that would result from their construction. Sufficient information will be presented for Congress to consider authorization of those projects that are needed within the next 15 years. Of course, let me emphasize again - this is a plan. It is up to Congress to decide whether these projects we recommend will be authorized or not. Any long term improvements will be discussed in a more general manner since they should be reviewed prior to construction in any event. The appendixes to the report will include the description of the investigation by each participating agency. The final report on this study is now scheduled for completion in 1967, provided of course, that funds are made available as they are now presently scheduled.

Thank you.

LT. COLONEL BETTS: Thank you, Fred.

Ladies and gentlemen, I would like to remind you that this came from the man who's going to do the work.

The Soil Conservation Service, the Economic Research Service, and the Forest Service of the Department of Agriculture are making some of the primary determinations in the study, as Mr. Bayley pointed out to you. I would like, at this time, to call on Mr. Bill Heard, Department of Agriculture, to explain the position of his department in the comprehensive plan and the degree of their participation, Bill -

MR. HEARD: Thank you, Colonel Betts. I'd like to remind you now that I speak as the designated departmental leader and not as a State Conservationist of the Soil Conservation Service. From the point of view which we represent, the objective of the comprehensive study is to get a plan to guide the orderly development of all the water and related land resources of the Big Black River Basin to keep abreast or ahead of the needs for water in the area. This statement comes from the fact that we believe, that is, that water is largely a product of the land and that we cannot divorce the yield of water, the products of the water, the rate at which water flows, etc., from the conditions of the land itself. Let's keep in mind also that the Big Black River Basin is primarily an agricultural area and will, in the foreseeable future, continue to be an agricultural area. Most of the land in the Basin is privately owned and is operated by family-size farmers. We have already determined that more than 50 percent of the farmers within the Basin have a gross farm income of less than \$2,500 a year. One of the major objectives of the agricultural leaders in the area, I'm sure, is to improve the lot of the low-income farmer. We believe that this will be done, a large part, through application of Soil Conservation measures, including measures for flood control, irrigation, stabilization of critical eroding lands, and other various types of conservation measures.

As has been pointed out, we do have considerable responsibility in this study through the activities of the Soil Conservation Service, U. S. Forest Service, and the Economic Research Service. These Services pool their efforts together as to the specific responsibilities in the collection and analysis of basic data, some of which we will provide the Corps of Engineers as the basis of coordination of our thinking. We expect to work closely with all of the departments and agencies involved in the various undertakings that we are jointly charged with.

Some of you will recall that the Department of Agriculture was originally involved in the Big Black studies by virtue of its authority to make comprehensive investigations under Section 6, Public Law 566. As a matter of fact, appropriations from this source are now being used to defray most of the costs of this investigation. Sometime ago, back in 1963, under the sponsorship of the Mississippi Board of Water Commissioners, we initiated an inventory-type study in the Pearl River, Big Black, and the undeveloped streams of southwestern Mississippi and eastern Louisiana, and have been progressively engaged in this during that period. As a matter of fact, in earlier years we had already completed an inventory-type study in both the Yazoo-Mississippi Delta, and the Tombigbee River Basin of Mississippi and Alabama. They differed from these studies in that they did not encompass any type of planning. They were purely inventory-type studies.

However, in July 1964, these surveys took on greater significance, when we embarked on the concept that the four Federal departments involved would jointly participate in studying needs and developing an overall plan for water resource projects to meet the immediate and longtime needs.

I'd like to point out here now some of the major phases of our investigation. I will not try to go into too great detail. That's the reason I have a piece of paper here, to keep me from straying off into too great detail.

First of all, with respect to upstream flood control. Most of you here are familiar with our flood prevention projects on the Yazoo-Tallahatchie River Basin to the north. As a matter of fact, we have five projects, PL 566 projects, authorized for operation in the Big Black Basin - two of them in this county, one in Holmes County, one in Montgomery County, which is actually suspended for the time being, and one in Yazoo County. We find also that there are a total of 37 small watersheds of 250,000 acres or less that have some potential for PL 566 projects. At least they lend themselves to study under the concept of PL 566 activities in this basin. Several watersheds in addition to the five that I mentioned, five others have been selected for rather extensive study on the basis of projecting and carrying on less detailed studies in the remainder of the watershed with respect to our flood control requirements with respect to these small tributaries. Let's keep in mind also that the best row crop land in the basin is found in the valleys of these 37 tributaries. Most of these tributaries flood rather frequently, and the Department will study each of these in more or less detail to determine the need for adjustments in land use, land treatments to control erosion, and excessive runoff, the need for small dams to hold back flood-water from damaging crops on productive bottomlands, and need for channel improvements on tributaries to enable accumulated runoff to be discharged into the main stem of the Big Black. Studies will include estimating flood and sedimentation damages. Keep in mind that one of the major sources of damages on many of our Mississippi streams is from sedimentation. We will also determine the level of protection of flood plain lands, and estimate costs and benefits for two alternate combinations of structural measures.

Although irrigation is not presently practiced to a very great extent in the basin, we plan to determine present and future water requirements for irrigation of agricultural lands in view of the changing factors that face us in agriculture. This will include studies of plant requirements, yield or response of plants to supplemental irrigation, increased cost of production, availability and cost of providing water, cost of and net returns from irrigation.

Drainage has already been mentioned to some extent, but we expect to determine the extent of lands with drainage problems and the measures needed to solve drainage problems. We firmly believe that much of the potential for economic growth of Mississippi depends upon the full utilization of our abundant water supply. The Department will determine availability of surface water at points within tributary streams, analyze the effects of land use and land management practices and upstream watershed

developments on flow characteristics of streams. We expect to determine the potential storage and costs in each of the proposed upstream flood-water retarding damsites. In the formulation of the plan, we will provide data for meeting future needs of water for recreation, fish and wildlife, municipal, industrial, and other beneficial uses of water. This is all within the small tributaries and watersheds.

Now let's talk about soils and land use. You might say this is our bread and butter responsibility. As a matter of fact, all of this is our bread and butter responsibility. We will make studies throughout the basin to determine potential capability of the land for production of crops, pastures, and woodland products. This will include a study of soils, land capabilities, erosion problems, and various land treatment measures that may be needed to bring watershed lands up to minimum acceptable management levels.

The Department will conduct studies to determine possibilities of farm-based income-producing recreation enterprises. In other words, those enterprises on the farmlands that will bring income to the farmer. More and more farmers will be using their lands to meet the growing demands for public recreation enterprises, which include fishing and hunting. The Department will locate potential sites in small watershed projects for water-based recreation and will estimate costs for water storage for these purposes. Studies will be conducted to determine potentialities of multi-purpose use of watershed lands, such as managing woodlands for timber production, recreation and wildlife.

There will be a number of other special studies that will be carried on including: Present and future needs for rural water supply, present and future needs for forestry resources within the area, and present and future projections of agricultural production.

I would like to stress the next section. This goes back again to cooperation and coordination of effort. We have given you assurance of our intentions with respect to internal coordination within the Federal departments, but there is another phase of this exchange of thought we think is very significant. At the local level, the Department will be responsive to ideas and views of soil conservation districts and water management districts within the Basin. Under State law, soil conservation districts are responsible for the conservation program within their boundaries. There are 11 soil conservation districts now operating in the Big Black River Basin. Already there are 17 water management districts in the Basin, all of which are co-sponsors with soil conservation districts of applications for Public Law 566 watershed projects. The Department has recognized the contribution that the soil conservation districts and water management districts have made in carrying out plans for developing resource-type projects. We certainly expect to make full use of the help afforded by these groups.

Now let's discuss one other aspect, looking somewhat into the future. When the organization of contemplated Big Black Basin District, authorized

by House Bill 614 of the Regular Session of the Mississippi Legislature of 1964, is completed, the Department expects to solicit the views and ideas of the Board of Directors of this political subdivision of the State, and to work with it in every way possible in helping it to prepare a long range plan of action, because this will be an action agency if formulated, for its participation in the development of the land and water resources of the Basin. It is expected that information and reports which the Department develops will be of particular assistance to this district as it plans for a program of progressive action in the water resource development of the Basin.

The Department will work closely with the Mississippi Board of Water Commissioners, which is still the original sponsor of agricultural studies within the Big Black and several other basins in the State. We still have an obligation to this agency which we will fill comparatively to that of our Federal obligation.

As the last part of our responsibility, the Department will prepare a report. Now this does not short-circuit the primary report which is now referred to, but will be a Departmental report including a plan covering projects to be carried out by the Department. This plan will also have been fully coordinated with the Corps and all the participating agencies. In fact, it will be pulling out the departmental phase and putting it into a document. It will be in sufficient detail for Congressional consideration, to say the least, and will include the projects recommended for construction in the next 15 years and will also contain statements on projects needed over the 50 year period.

We feel very strongly about our responsibility in this activity and I say that Mississippi is most fortunate to have three of these comprehensive type studies going on simultaneously out of 16 or 17 in the whole United States. We feel quite strongly in our responsibility because here we have an opportunity to work with other agencies to develop information and project planning for the full development of the economic opportunities of the State.

LT. COLONEL BETIS: Thank you, Mr. Heard. I would like to stress one of the points that Mr. Heard made, that is the complete cooperation that we expect to achieve by the State, Federal, and local agencies and the people in developing this plan. I think he made a very good point of it. He did mention the fact that there are three of these studies going on in Mississippi. You will recall Mr. Bayley mentioned the Economic Base Survey that the Michael Baker Company is doing, and you may wonder why the entire State of Mississippi is included. As Mr. Heard pointed out, there are three of these comprehensive basin planning efforts going on: One for the Big Black, one for the Pearl, and one for the Pascagoula. The Economic Base Survey that is being developed is - for use in all three of these basin planning studies. Since we are talking about these other basin plans, especially the ones on the Pearl and the Pascagoula, I would like to recognize two of the people from the Mobile Engineer District who are present here with us today who will be involved in those studies. - Mr. Del Homme and Mr. Dinnean. Will you

gentlemen please stand up. These gentlemen will be engaged in an operation very similar to ours.

To go on with the participating agencies, I would like to call on Mr. Scruggs with respect to the participation of the Fish and Wildlife Service. Mr. Scruggs, will you come forward.

MR. SCRUGGS: I have here a statement addressed to the Colonel for the record. Reads Exhibit B.

LT. COLONEL BETTS: Thank you, sir.

At this time, I would like to call on Mr. Stone to make a statement with regard to the participation of the Public Health Service. Mr. Stone.

MR. STONE: Reads Exhibit C.

Similar to Mr. Heard's program, we are under two mandates. Under Public Law 660, we will study the streams in the southeastern United States to develop a comprehensive water pollution control plan. There's another mandate that made the Corps of Engineers the leader in the study of the Big Black. Under that authority, we are cooperating with the Corps of Engineers - so this paper may sound like it discusses two programs and it does. One is a Public Health Service Program and one is the Public Health Service coordination with the Corps on a more comprehensive program on the Big Black. I think that will describe the Public Health Service responsibility.

LT. COLONEL BETTS: Thank you Mr. Stone. That finishes the part of the presentation in which we hoped to tell you how we are all tied together in this thing and where we're going.

I feel remiss to go any further without calling on Mr. Hailey who is the Governor's representative on the Coordinating Committee. At the time the Coordinating Committee was formed, we requested the Governor to designate his representatives to make sure that the state was adequately represented here. I would like to call on Mr. Hailey at this time to make such statements as he may desire.

MR. HAILEY: As you can see, these men have gone into quite a lengthy discussion here. To make this project a success, the needs and desires of local people must be the primary consideration. For instance, we are mainly interested in land use here. As they go along, if they find it feasible to put a reservoir somewhere, we want to know how much land will that take from the local people. Before the state makes a statement about this thing, we would like to get the feelings of the local people on how you think it's going to affect you and are you for or against it. I'd like to see how much land it's going to

require over a period of 50 years and how much good will it do. Another thing we have to consider is the local efforts required to form these districts and how much money it's going to cost you on a local level. That's the question as I see it along with this coordination mentioned here. The local people are going to be considered in this thing in the first place. Now as the studies progress, we'd like to hear from the local people - the ones that will be affected by this thing. We want to know what you think about it.

LT. COLONEL BETTS: Thank you, Mr. Hailey.

In a little while we are going to throw the floor open for your statements, suggestions, and your questions. I would like to show a film which was developed in a comprehensive plan on the Potomac River to make sure that you have the concept of the way we intend to approach this plan implanted in your minds. I would like you to keep in the back of your minds that all water basins are different. The history that you will see come out in the Potomac study is different than it is here. The basic water requirements are different. For example, in the Potomac Basin is the metropolitan area of Washington, D.C., which as you will see, has a major influence on plans developed. In fact, such a major influence that there is a very heavy accent on reservoirs and water supply which is not necessarily the case here. I think that there are a lot of very fine points to be gained from this film, specifically the cooperation of the Federal agencies, the factors to be considered, and the impact in relation to these factors. I would like you to consider the fact that though this film was made by the Baltimore District of the Corps of Engineers, it could have been made by any of the agencies designated field leader in such a study. So, in order that we make sure we get this to you properly before we go, I'd like to show this film. I think you'll enjoy it.

(Movie is shown).

The nature of the plan, the impact on local people, of course, is different in the film. As you saw, in the film a public hearing was held. This is the type of public hearing we will have later on when we start developing ideas as to the types of features that will be included in the various types of plans concerned. Of course, at this meeting today we would like to get your specific feelings, what you are for and what you are against. At this particular time then, I would like to open the meeting for any particular statements that you would like to make either written or oral and would like to ask you as you do so, please identify yourself to make sure it's in the record. This microphone is removable and we will be glad to pass it around, and I invite all of you to participate to the maximum you desire. Remember what we would like to know, "What do you think at this particular time". Before going much further, I'd like to call on Mr. Russell Fox, who is a Member of the Mississippi Senate. Do you have anything you'd like to say at this particular time, Mr. Fox.

MR. FOX: I have some questions. I supported this bill without going too far into it. There is an amendment that provides that before the local people decide to participate under this bill, they have to vote on it. We have a port authority at Port Gibson at Grand Gulf which has great potential. Colonel Everett was very much interested in this and I hope you will familiarize yourself with it. My reason for submitting this amendment was that in some of the counties, you have other authorities. For instance, in Warren County you have the Harbor at Vicksburg and also the possibility a reservoir on the Big Black. In Hinds County and in Madison County here, you have both the Pearl River Area and the Big Black. There was a provision for the Pearl River area above Jackson that the state can give two mills to be used to refinance those funds.

While I support this as a state measure, I am concerned about local potential flooding below. Do I make myself clear?

LT. COLONEL BETTS: Yes, sir.

MR. FOX: We live at the discharge of the Big Black River into the Mississippi River.

Some years ago, the Corps of Engineers helped work up, I believe it was a WPA project, that required the counties through which the river ran if the river overflowed, to assume the financial responsibility. Suppose all the water up in this area from this river came down and all the discharge jumped out on us. Here's the problem, sir, that I'm concerned with. I am in sympathy with the project. I think it has a great deal of merit in the upper reaches, if we can stop the overflow down below. We can also provide large areas for impounding water similar to the Pearl River reservoir. We have a particular interest from an industrial standpoint, in the area where these large impoundments of water would go. Unfortunately, there is a problem below such a reservoir in some cases. I'm speaking from my background in handling the pollution bill for many years in the state and am now Chairman of that Committee. There is a problem below the dam in Jackson, Mississippi, where effluent, both industrial and sewage, is discharged from a common outlet. Down below Copiah County is just a raw sewer and we're in sympathy with these people. We would like to know what can be done to control the open sewage. I know Game and Fish Commission is in charge of industrial pollution, and the Board of Health is in charge of sewage. Under this Bill (House Bill 614, Mississippi Legislature), Section 11, Rules and Regulations, the Commission itself has charge of all water in, and flowing into, one of these reservoirs. Under these rules and regulations, they can fine a man \$1,000 a day or give him 15 days if he dumps sewage into the reservoir and every offence is subject to a separate fine. That, of course, helps prevent pollution of waters above the reservoir and in it, but what about us down below. Under the authority, there seems to be no authority to cover this situation. I don't want us to get into the situation of getting the disadvantages and none of the advantages. We would like to know what

we can anticipate other than alleviating some of the flood damages. We have a tremendous potential for river development down at Grand Gulf. One of the most tremendous potentials in the country and that River is one of our sources of water supply. A fellow from the Game and Fish Commission just told me last week we had some of the purest and clearest water in the Mississippi area in the Big Black River. It's abundant. We're not being selfish, but I'd like to ask Miss Davis what benefits we can expect?

LT. COLONEL BETTS: Miss Davis, would you like to answer that?

Miss Claire Davis.

MISS DAVIS: Colonel, I could talk on this all day long. For the benefit of those who do not know, we are a state-wide organization, responsible and dedicated to the clear purpose of state-wide waterway development. We have no State, we have no Federal association whatsoever. We belong to the people of the State of Mississippi and are supported by their funds solely.

Now in 1954 in the General Session, we were responsible for the legislation that was passed and signed by the Governor. The number of the House Bill is 614, it authorizes the Big Black Waterway District. This District can only be formed when five counties come into the district out of the eleven. It does not have to be parts of the county; it can be the entire county involved. We are hoping the district will be formed and in operation by the middle of the summer of next year. This will depend, of course, upon how the people in the counties vote. That basically sets up what we are and how the bill was set up. As for Claiborne County, it is in a particular situation in that it has the smallest portion of the county lying within the district itself - 15 percent of Claiborne County. It also does have the Port Commission retaining 2 mills of the 4 mill Ad Valorem Taxes. Now I feel that the biggest percentage of the work that would help all the counties, not just Claiborne, but all the counties, would be the small watershed work that could be carried on. There's a special provision in House Bill No. 614 that allows the district, when formed, to put their county in the Soil Conservation Service, if they so desire and to set up their own planning party. Under 614, if you set up your own planning party, you would have first priority. This would be tremendously helpful to Claiborne County or any other county in the district, not just the 15 percent but 100 percent of the county if the entire percentage came in. It could then work in small watershed work, involving pollution control, flood control, water retention, and recreation development. As you go along, you will see that this is some of the work that can be done now before the Corps of Engineers Report is complete. We have some of the work going on now in the Pat Harrison and the Tombigbee. Pat Harrison has already set up their particular work with the Soil Conservation Service. They have seven watershed projects ready to go and also have two large projects they are working on. On one of these projects, a reservoir at Meridian, they received a \$500,000 appropriation from Congress this year. They have recently

asked for extensive studies in the Laurel Area as an advanced program of the Corps of Engineers report. Now this is the type of work that can be done in every county within the district, if the district is formed. But, you need this coordinated effort in all those counties in order to do the work. Now, presently, when a small watershed district is formed, it has to go through all the normal procedures, court procedures, get your petitions, go through the Chancery Court, etc. This can take sometimes several years, depending upon the cooperation of the people involved. Yet, under the district if it were formed, you would have at least five of your counties and thus could set up your legal authority. It would no longer be necessary for each individual watershed project to go through all the legal action that is required, because it can fall under the legal action of the overall district itself. Now, this is general. I don't know if I have answered your question directly or at all. If there are any questions you have, I would be glad to answer them.

Pollution control is included in the overall work of the District, along with water supply, water retention, water storage, etc.

LT. COLONEL BETTS: I would like to point out one thing, Senator, and that is the particular bill to which you are addressing yourself, sir, is a Mississippi State Bill, in which we, as a Federal agency are not directly involved.

MR. FOX: Is there any other authority to at least protect the people below the reservoir?

LT. COLONEL BETTS: I would like at this particular time to recognize Mr. Horace Lester, Member of the Mississippi House of Representatives. Do you have anything you would like to say?

MR. LESTER: I would just like to tell my colleague here (Mr. Fox) that we are all interested in clean water. Also, we started trying to clean up the river below Jackson yesterday. Mr. Fox has mentioned a very important part of the river basin planning and I would like, if you don't mind, Colonel, to make one comment here. The law that Mr. Fox refers to comprises or imposes itself over the same geographical limits that your study is composed of, and I would like to encourage Madison County and Claiborne County and the other counties in the basin to go ahead and organize their Big Black Drainage Development District so that they can begin to work with this study. When these studies are finished, you will then be ready to start on the main planning. However, I think it would be well to organize now along with them.

MR. FOX: I'm not against this thing. I voted for it, but the thing that concerns us is that we are on the lower end of this stream and we put up 1/2 mill; but what can we hope for out of this district other than a lot of pollution?

MR. LESTER: To answer your question, the pollution control bill that came up in the earlier part of the last session, has the implementation

of your protection in it. The point is that once the rivers are polluted, at the point the cause of polluting should be made to clean up this contribution to the rivers, I believe that your pollution control act that was passed, and the public emphasis of the Big Black Basin Development to see that the Game and Fish Commission and Public Health Service do what they are supposed to do, will see that that doesn't happen to you all. I think in this particular case you have tremendous potential in supplemental irrigation in Claiborne. I'm really interested in the agricultural end of this thing, and while I'm on my feet, Colonel, is my letter to you automatically put into the record? I would like to request that it be made a part of the record at this time.

LT. COLONEL BETTS: Thank you, sir. Your letter has already been made a part of the official record, I understand. (Exhibit D)

At this particular time, we have, as a result of these slips that were passed out, indications that certain people might wish to make statements. I will call on those first and then anyone else to make statements as they desire.

First of all, Mr. Cain indicated he might want to make a statement.

MR. CAIN: Colonel Betts, I represent approximately 40 landowners located in this basin. We are basically for this. We love this land like you all love water. We are very strong for flood control. We think this can be done by putting structures upstream, up the tributaries, and by relocating, deepening, and widening the Big Black Channel. But now another reservoir is different. Frankly, though one of my clients has 10,000 acres, they don't have enough. We love that land and we'd like to keep it, and we are against any storage of water in our area.

LT. COLONEL BETTS: To summarize your statement; you are basically against a major reservoir on the main stem that would impound large volumes of water and cover the agricultural acreage.

MR. CAIN: That's correct.

LT. COLONEL BETTS: Thank you, sir. Let the record reveal that Mr. Cain has delivered a statement that he would like made a part of the record. (Exhibit E)

Next, I have Mr. Gil Watson from Madison Livestock. (No response).

LT. COLONEL BETTS: Mr. P. L. Hughes, would you like to make a statement, sir.

MR. HUGHES: My understanding, Colonel Betts, is that this particular study that you are discussing and the district that Russell Fox raised are two entirely different things. Yours is an economic feasibility study, is it not? Until we hear what your recommendations are, there's not much need in going into detail. I agree with Mr. Cain; that our people right here are not interested in anything compared to the Pearl

River Reservoir, because we don't feel like we need it, and I feel like your study is going to show that. I have studied this bill passed last session and I think it's a good thing. I think it's well that we form ourselves into this district so that we will be in a position to act as time goes on. It is a long range thing. It's not something that we can decide to act on today and tomorrow see the effects of it. It's something that we have to start and look forward to for years. The main idea in setting this thing up, is the fact that you can't wait until we need a water resource project and then jump up and do it. You have to make plans and studies. I doubt seriously if too many of us here today will ever see the completion of it. Personally, I think it is a good thing. Of course, there will be a lot of questions raised. We do have to think about this land use and the possibility that a great amount of land could be covered up with water. We feel like we need the land more than we do the water, and I do think that it's very necessary that we conserve the water that we have in the best manner we can. That's about all I have to say.

LT. COLONEL BETTS: Thank you, sir. You are absolutely right. The purpose of our comprehensive plan is to develop a plan to project the water needs of this particular basin for the 50-year period and as a part of these investigations, make our studies in such detail that Congress could authorize those items which are needed within the 10 to 15 year range. I would like to add, for Mr. Fox's benefit, very definitely pollution control is a part of our study.

Next, I call on Mr. H. Henry Jones.

MR. JONES: I think my questions have already been answered.

LT. COLONEL BETTS: Alright. Thank you, Mr. Jones.

Mr. Malcolm N. Warren stated on his registration slip, "Let's get going."

Do you have anything further to say, Mr. Warren?

MR. WARREN: I would like to say with all due respect to all the questions that have been asked, I believe that some of them are rather premature. This is a comprehensive study and what I intended to say was, "Let's get going with the study." Then, a lot of these questions will be automatically answered. That was what I intended to say. Thank you, very much.

LT. COLONEL BETTS: Next, Mr. Wiley H. Hatcher, rancher from Port Gibson.

MR. HATCHER: Colonel, when will these studies be completed?

MR. BAYLEY: 1967.

LT. COLONEL BETTS: Next, Mr. Nelson Cauthen.

MR. CAUTHEN: I had to leave the meeting to go to a bank meeting - I get paid for going to that meeting - and I got back as soon as I could so this question may already have been answered. How much will it cost Madison County to make this study?

LT. COLONEL BETTS: Sir, this is a Federally financed study. A large portion of the money will be programmed and budgeted by the Corps of Engineers. Certain of these funds will be made available to the other Federal agencies and they in turn will use certain of their funds in conjunction with these studies.

MR. CAUTHEN: Will we be committed to anything before the studies are complete.

LT. COLONEL BETTS: No sir. I would like to emphasize that as these studies develop, and before the report goes forward to Washington, we hope to achieve complete local and Federal agency agreement as to responsibility of various agencies and people, with regard to any projects proposed.

Right now the study is completely financed.

MR. CAUTHEN: Well, let's start two of them then.

LT. COLONEL BETTS: This completes the list of people who indicated on their slips that they wanted to make a statement. Is there anyone present who would like to speak.

MR. MATTHEWS: I am L. S. Matthews, Mayor of Canton. I am in favor of the studies including all phases - pollution control, agriculture, industrial uses, etc., and keeping in mind what Mr. Cain has said about no dam across the river itself at this time - I understand that covers a 50 year period and might come in later.

LT. COLONEL BETTS: I might make a statement here with respect to the value of land. I have the importance of an acre of land today visibly impressed upon me everywhere I go in the Vicksburg District. I have had many, many, people tell me, "It may seem to some people that they can buy it and do this and that with it, but where are we going to get another." This is a very important fact today. That is particularly true about the people who live on the Mississippi where the caving banks of the Mississippi eat up valuable farmlands. They come into the office all the time.

Are there any others present who would like to make a statement.

MR. LESTER: I would like to make one comment along the line we're talking about. We did not find any adverse public opinion to the acquisition of lands that were necessary for the Pearl River Reservoir that were not croplands. I think, if you will confine the impoundment to land that is good for nothing but impoundment, you will find that the people will support the project.

LT. COLONEL BETTS: Anyone else present who would like to make a statement?

I would like to conclude by making this statement. We're going to be working on this plan. Mr. Fred Bayley, who is with us here today, will be working very closely at a working level with all agencies and the people involved. We know that the people have definite feelings about what they think should be done and should not be done. If additional factors come to light to you at any time, I hope you will call them to our attention. I hope you will feel free to visit us or send me a letter stating these facts and asking that they be appended to the record. I will be most happy to consider them and will make sure that all factors are considered. This is our desire. I think most everybody knows how to reach me - just say - "District Engineer, Vicksburg, Mississippi." It will probably get right to me.

Before closing the meeting, is there anything anybody would like to get on the record. This is the official record. If not, we close the public hearing.

Thank you very much.

A resolution from the Canton Chamber of Commerce was received subsequent to the public hearing with the request that it be made a part of the official record of this hearing. (Exhibit F)

EXHIBIT A

U. S. ARMY ENGINEER DISTRICT, VICKSBURG
CORPS OF ENGINEERS
P. O. BOX 60
VICKSBURG, MISSISSIPPI

9 October 1964

NOTICE OF PUBLIC HEARING

BIG BLACK RIVER, MISSISSIPPI
COMPREHENSIVE BASIN STUDY

The Vicksburg District Corps of Engineers and other Federal and State agencies are making a comprehensive study of the Big Black River Basin in response to the following Congressional resolutions:

"Resolved by the Committee on Public Works of the House of Representatives, United States, That the Board of Engineers for Rivers and Harbors be, and is hereby, requested to review the reports on Big Black River, Mississippi, submitted in House Document No. 72, 73rd Congress, 1st Session, with a view to determining whether the recommendations contained therein should be modified in any way at this time, particularly with reference to the tributaries of the Big Black River."

"Resolved by the Committee on Public Works of the House of Representatives, United States, That the Board of Engineers for Rivers and Harbors be, and is hereby, requested to review the reports on Big Black River, Mississippi, published in House Document 72, 73d Congress, with a view to determining whether the existing project should be modified in any way at this time in the interest of flood control and allied purposes."

The purpose of this comprehensive study is to develop a logical plan for the development of the water resources in the basin to satisfy the water and water-related needs in the area for the next 50 years. The investigation is described more fully in the inclosure to this notice.

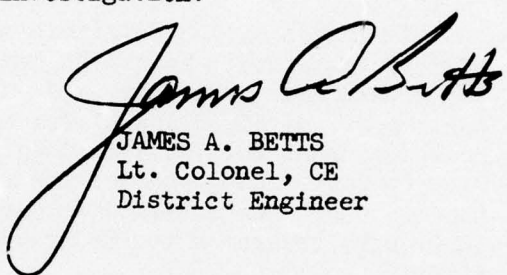
The Vicksburg District, as the Field Leader for this study, will hold public hearings at the Court House in Winona, Miss., at 2:00 p.m. on Wednesday, 4 November 1964, and at the Court House in Canton, Miss., at 2:30 p.m. on Thursday, 5 November 1964. These meetings will be similar in that the material presented by the Corps of Engineers and other agencies will be essentially the same. They will afford the people in each area an opportunity to express their views regarding the need for water resources development and to provide information on any specific projects that they desire or oppose.

Therefore, I invite all interested persons to be present at either of the meetings mentioned above. They will be given full opportunity to express their views concerning the character and extent of the water needs, and the improvements desired. Proponents of any specific improvement are urged to present pertinent factual material bearing upon the general plan of improvement desired. Opponents to any particular type of improvement in the basin are also urged to state the reasons for their position.

Oral statements will be welcomed at these hearings; however, for record purposes proponents and opponents of any particular type of water resources development should submit their arguments in writing.

Please bring the foregoing to the attention of persons known to you to be interested in this investigation.

1 Incl
Information Sheet



JAMES A. BETTS
Lt. Colonel, CE
District Engineer



EXHIBIT B

**UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
PEACHTREE-SEVENTH BUILDING
ATLANTA, GEORGIA 30323**

November 2, 1964

District Engineer
U. S. Army, Corps of Engineers
P. O. Box 60
Vicksburg, Mississippi 39181

Dear Sir:

Reference is made to your notice of public hearings, dated October 9, relative to the comprehensive basin study, Big Black River, Mississippi, being made in compliance with resolutions of the Committee on Public Works, House of Representatives, United States Congress.

We appreciate the opportunity to participate in this hearing and have asked our Vicksburg office representative to make this statement in behalf of the Bureau of Sport Fisheries and Wildlife.

Our participation in this comprehensive study will be in accord with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), and in cooperation with the Mississippi Game and Fish Commission.

The Bureau of Sport Fisheries and Wildlife will inventory fish and wildlife resources existing in the Big Black River Basin and estimate the present and future level of sport hunting and fishing and commercial fisheries harvest. The capacity of the lands and waters of the basin to produce fish and wildlife will be appraised in order to determine the ability of the environment to meet future hunting and fishing demands. These studies will permit a determination of fish and wildlife shortages which may occur and the developments required to conserve or increase the resources which will be needed by hunters and fishermen. The Bureau of Sport Fisheries and Wildlife will report on features of the comprehensive plan and make recommendations as required to maintain or develop fish and wildlife resources at a level commensurate with future needs.

The opportunity to present this statement is appreciated.

Sincerely yours,

Walter A. Gresh
Regional Director

EXHIBIT B

EXHIBIT C

Statement
of
GORDON E. STONE
Sanitary Engineer Director
U.S. Public Health Service
Department of Health, Education & Welfare
Jackson, Mississippi

for the

Public Hearings of the U. S. Army Corps of Engineers
on the
Comprehensive Study of the Big Black River Basin, Mississippi
Vicksburg, Mississippi

September 1964

I am Gordon E. Stone, a Sanitary Engineer of the United States Public Health Service in the Department of Health, Education, and Welfare. We have an office in Jackson, Mississippi Field Office of the Southeastern Comprehensive Water Pollution Control Project of the Division of Water Supply and Pollution Control of U.S.P.H.S. The Southeastern Water Pollution Control Project is authorized by the Congress under Public Law 660, and is engaged in a long range study of all factors of water quality now affecting, or which predictably can affect, the legitimate uses of waters within the study area. When this study reaches the report stage, it will be possible to predict for any stream within the study area, the effect of any present or proposed discharge of polluting material on the downstream water uses. This will permit Federal, State, and local officials and businessmen to plan intelligently for adequate pollution control and to adopt sound policies to implement such plans.

Concurrently with our own comprehensive study, we are participating as a cooperating member in the comprehensive river basins studies being

EXHIBIT C

made by the various Federal agencies concerned with the development and use of water resources in which one of the other agencies serves as principal investigator and coordinator. Such is the case with the comprehensive study of the Big Black River in Mississippi, with the Corps of Engineers being the leader.

Our immediate study will provide the following information:

- (1) the present quality of water in the Big Black River Basin;
- (2) the effects of the present quality on present uses;
- (3) the required quality for possible future uses;
- (4) the feasible alternatives by which the required quality can be achieved.

These data will then be used by the Corps of Engineers to determine the structural measures required for flow regulation within the next ten to fifty years to achieve the quality recommended. Our study likewise will evaluate the effects on water quality of structural measures proposed by the Corps of Engineers, other Federal agencies or by non-federal agencies where known. It will recommend modifications which will improve the potential of such structures for water quality benefits or which will reduce incidental damages to water quality which may otherwise result.

The present study by the U. S. Public Health Service includes an inventory of existing sources of pollution and determination, by analysis of samples from the river and its tributaries, of the chemical, bio-chemical, bacteriological and biological characteristics of the water.

The same data obtained as a basis for recommendations required by the Corps of Engineers for their comprehensive study will also become a part of the data which our Southeastern Comprehensive Water Pollution Control Project

will require in the development of a long range water pollution control plan. It is the goal of the U. S. Public Health Service to so develop and store data on the characteristics of the basins that requirements for water treatment or flow augmentation may be readily determined for any desired water quality criteria and proposed pollution load. These data are to be kept current with periodic review of the pollution control plan in order that they may be of maximum benefit to the using agency or entity whether it be Federal, State, municipal or private.

These studies will require the cooperation and assistance of all of the Federal, State, and local agencies concerned with water resource development. The U. S. Geological Survey and the Mississippi Geological Survey are furnishing data on water availability and flow characteristics; the Mississippi State Board of Health is contributing laboratory space and equipment and performing a portion of the laboratory determinations; the Mississippi Water Board, the Mississippi Game and Fish Commission, the State Board of Health, and the State Oil and Gas Board are all furnishing data on possible sources of pollution. Arrangements are being made with the Mississippi Game and Fish Commission to make biological studies of the streams pertinent to these studies.

The uses to be made of the waters are largely a local determination. Having learned the characteristics of the streams and the regulation, by means of structures, proposed by the Corps of Engineers, the Federal Power Commission, the Soil Conservation Service or non-federal agencies, the Public Health Service will show the quality needed for each of the possible uses. The alternative to be selected will be a local determination with assistance from State and Federal agencies.

The studies are designed to develop a comprehensive water pollution control program which will provide for all present and future water needs and uses in the entire river basin in which water quality plays a role. The objective sought is the preservation or improvement of the quality of the waters of the basin in such a way as to insure continuing optimum benefit from them for the basin as a whole, at minimum economic cost.

EXHIBIT D

HORACE B. LESTER
HINDS COUNTY
1350 EASTOVER DRIVE
JACKSON, MISSISSIPPI



HOUSE OF REPRESENTATIVES

JACKSON

October 29, 1964

COMMITTEE ASSIGNMENTS
DRAINAGE, VICE CHAIRMAN
FISHERIES, COMMERCE & SHIPPING
JUVENILE DELINQUENCY AND CHILD
WELFARE
PENSIONS & SOCIAL WELFARE
ROADS, FERRIES AND BRIDGES

James A. Betts, Lt. Col. C.E.
Chairman, Big Black Basin Coordinating Committee
c/o Vicksburg Engineer District
Vicksburg, Mississippi

Dear Colonel Betts:

I plan to attend the public hearing on the Big Black River Basin in Canton, Mississippi, on November 5, 1964, and wish to offer the following comments for review by your committee.

Although my limited knowledge about the matters discussed below is acknowledged, I am familiar with, and believe sufficiently informed about, economic development in the Big Black and Pearl River basins to propose further study on the two proposals outlined herein. These ideas came to my attention during efforts expended in helping develop the Pearl River Valley Reservoir near Jackson, Mississippi. I am enclosing copies of papers which outline the proposals to which I refer.

I propose (1) a Multi-Purpose Canal from a point near the Highway 43 Causeway on the Pearl River Valley Reservoir to a point near the north end of the Vicksburg harbor on the Mississippi River as a long range project, and (2) the "Madison Grain Farm Project" as an immediate objective. Please note the fact that the Multi-Purpose Canal proposal includes all five of the classes of economic benefit included in Government sponsored economic studies.

The channel conveying water for the grain farm proposal and the upper end of the Multi-Purpose Canal could easily be the same facility.

I particularly invite your attention to the possibilities for a HEAVY INDUSTRIAL COMPLEX reaching from Jackson to Vicksburg with the canal, a railroad, and an Interstate Highway parallel to, and in close proximity with, each other.

The Pearl River Watershed could not only furnish large quantities of water to an industrial complex such as mentioned, but could furnish the water under pressure since the canal would be constructed along a ridge by use of levees and

James A. Betts, Lt. Col. C.E.
October 29, 1964

Page Two

not in a channel as normally constructed.

The "need" for the grain production unit is best evidenced by the tremendous market value of corn imported into this area (best estimate available - \$25 million annually).

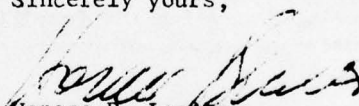
I would also like to add my personal and professional view concerning the potential for using the basin studies underway to advance the economic development of the basin.

The lack, here in Mississippi, of a specific pattern in the sociological factors so necessary for economic studies tend to resolve economic studies into inventories of resources. These studies within themselves do not reveal to the public in general the potentials inherent in the resources of the areas studied.

I believe a methodology by which specific works are selected-and-cost-to-benefit studies perfected in accord with usual procedures - will mean more to the basins under study at this time than will an "Inventory Type Study".

Trusting you and your committee will find the time to evaluate the proposals I mention and offering any assistance I can, I am

Sincerely yours,


Horace B. Lester
Representative
Hinds County

HBL/vh

cc: Honorable John Stennis, Senator from Mississippi
Mr. G.B. Herring, Chairman, Big Black Development Corporation

THE POSSIBILITIES
FOR
ENHANCEMENT OF GRAIN PRODUCTION IN MADISON COUNTY

Prepared by: Horace B. Lester
Lester Engineering Co.

PURPOSE OF PAPER

The purpose of this paper is to depict an idea for the enhancement of agricultural pursuits in the Madison County area by the use of irrigation, drainage, and land shaping procedures; coordinated processing, storage, and marketing programs; and long-term financing for capital improvements.

NEED

- (1) A source of "long-term" credit for financing capital improvements.
- (2) A program of coordination for land improvement, including irrigation and drainage facilities, land shaping, production, harvesting, storage, and sales.
- (3) An authority of some type to develop and administer the program.

ACTIVITY

Grain farms for the production of corn, soybeans, oats, wheat, sorghum, and other feed-type grain to support the poultry, beef, pork, and milk industry in Central Mississippi.

MAJOR REQUIREMENTS

- (1) Land levelled, drained, and/or otherwise shaped to accomodate mechanical farming and harvesting, including irrigation.
- (2) Large-scale irrigation works to provide adequate water for assured yields.
- (3) Support activities including seed and fertilizer distribution points, equipment rental repair and maintenance facilities, and special mechanical planting, cultivating, and harvesting units.
- (4) Facilities for shelling, drying, and/or otherwise processing, storing, and distributing grain.
- (5) A grower-user coordination program for determining and scheduling production with the market-area demand.

FINANCING BASE

- (1) Irrigation works financed by revenue bonds amortized by revenues from long-term "water-demand" contracts with individual farmers.
- (2) Long-term commitments by land owners for water purchase, assessments for improvements, and concessions from support functions, and/or
- (3) Individual farms shaped and drained through existing farm improvement programs.

TOPOGRAPHICAL ADVANTAGES IN CENTRAL PORTION OF COUNTY

Low cost water is available to lands located along the main stem of Bear Creek and near-by areas because of the topography of this part of Madison County. The Pearl River Valley Reservoir is more than 125 feet higher than the Big Black River and this condition affords ample head for the economical distribution of water.

(over)

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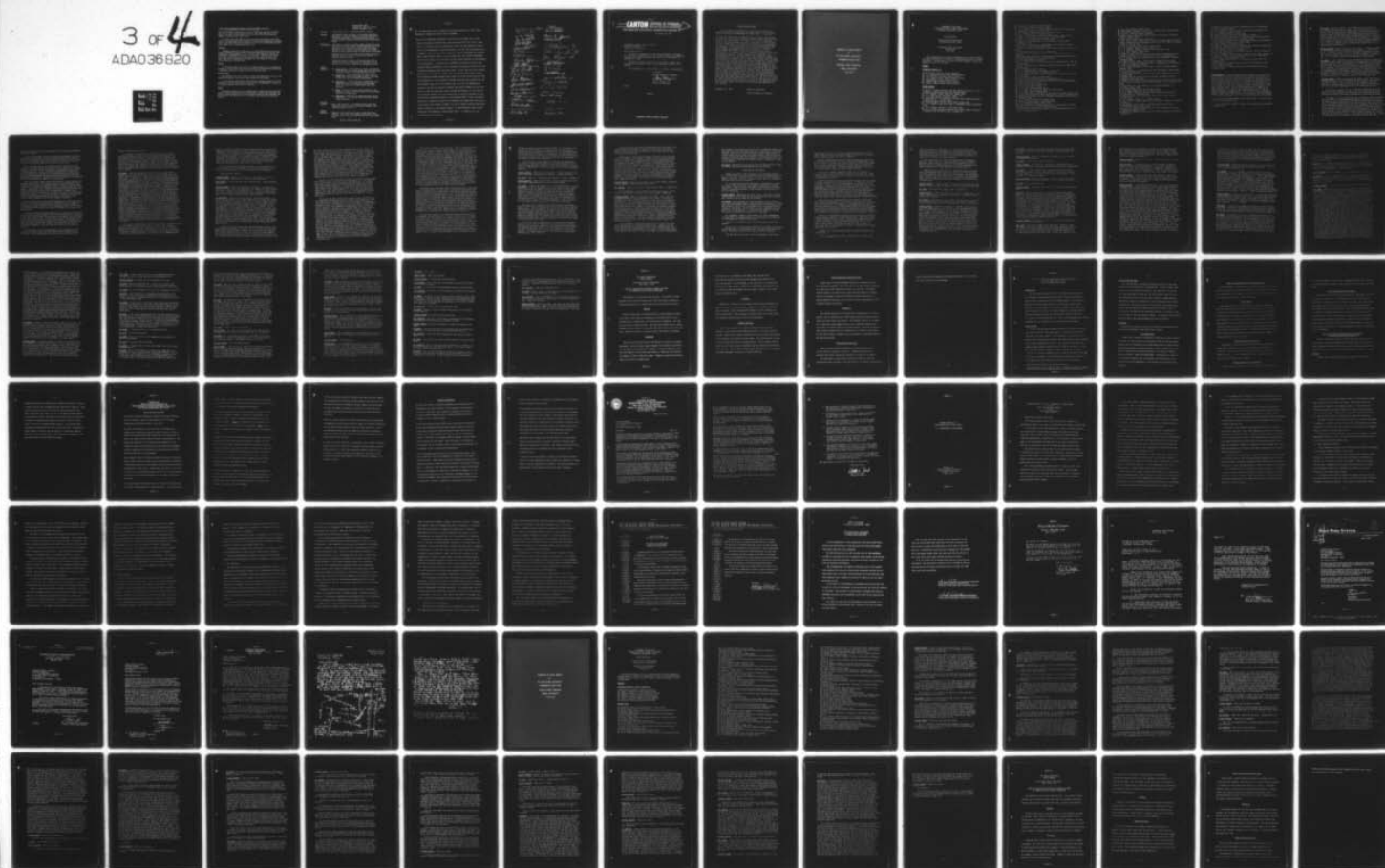
BIG BLACK RIVER BASIN COORDINATING COMMITTEE VICKSBURG--ETC F/G 8/6
BIG BLACK RIVER, MISSISSIPPI COMPREHENSIVE BASIN STUDY. VOLUME --ETC(U)
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TOPOGRAPHICAL ADVANTAGES IN CENTRAL PORTION OF COUNTY (Continued)

The Ridge dividing the Pearl and Big Black Watersheds is less than 5,000 feet side (toe to toe) at one particular location. The lands along all but 1500 feet of this route are less than 40 feet above water level and the maximum height is sixty feet above water level.

We believe the lands along Bear Creek and nearby tributaries can be made suitable for mechanized farming practices with reasonable expenditures of capital funds. More than 18,000 acres of productive lands can be watered from the Bear Creek Channel with a minimum distribution cost.

POTENTIAL

Tremendous quantities of feed grains are being imported into Central Mississippi to support the large poultry enterprises operating in the Central Mississippi area. Large numbers of beef cattle are being shipped to feed lots in the mid-west and returned to the area as prime meats. The feed grain demand from either of the above, and not including the milk, pork, dry grain, and other grain uses in the Central Mississippi area; can support a substantial farming operation in Madison County.

CONCEPT

It is believed that a year-round grain supply operation can be promulgated through use of an economical large-scale multi-crop grain production program and a coordinated processing, storage, and distribution procedure.

MISCELLANEOUS

Indications are that the savings in freight and handling will justify a substantial investment in each acre of land entered into the program.

A stable farming entrepreneur, administrators, skilled mechanics, and other residents of the area whose education and physical and temperamental interest do not properly prepare them for work in industry.

RESUME

The proposal outlined above is fundamentally a proposal for using long-term credit to provide large-scale capital improvements in agricultural pursuits and should provide assistance for the grain producer similar to that assistance now being provided the industrialist by Mississippi's Agricultural and Industrial Program.

Original Paper 1959
Prepared By: Horace B. Lester
Revised: November, 1964

SUBJECT: Multi-Purpose Canal - Madison-Hinds-Warren Counties

PURPOSE: The purpose of this fact sheet is to provide information pertinent to further development of the long range economy of Central Mississippi by the construction of a multi-purpose waterway between the Pearl River and the Mississippi River.

DESCRIPTION: Canal will be a water-level route between Jackson and Vicksburg with an auxiliary channel through Madison County to the Pearl River Valley Reservoir at a point near Mississippi Highway 43 and a secondary auxiliary channel via Raymond and Bayou Pierre affording water to South Central Mississippi.

Waterway to be supplied by water from the Pearl River Watershed and stored in a holding Reservoir near Edinburg, in Leake and Neshoba Counties.

Preliminary studies indicate a 50 mile main canal with a 250 foot lift from the Mississippi at Vicksburg and a 300 foot wide 12 foot draft channel in the navigable portions.

DIRECT BENEFITS:

- (1) Flood Control - Flood Control by storage and diversion to either Big Black or Mississippi River with protection afforded to Pearl River Flood Plain below Jackson.
- (2) Irrigation - Gravity irrigation for Central Madison County, most lands on west slope of Pearl, both slopes of Big Black, and east slopes of Mississippi.
- (3) Navigation - A water level route to Mississippi River, thence one series lock operation into Mississippi River and connection to inland America and costal waterways.
- (4) Power - Substantial head for power available at the Big Black crossing, on the east bank of the Mississippi and/or at the Yazoo Canal.
- (5) Recreation - Connection for Mississippi River recreational traffic to inland reservoirs and lakes located along Pearl River.

AUXILIARY BENEFITS: Water, under pressure, for a potential heavy water using Industrial Complex located along Interstate Highway, Railroad and navigable waterway.

UNUSUAL FEATURES: Hydraulic Grade Separation Structure at Big Black River Crossing. Canal route along ridges made possible by higher elevation in the collecting watershed than in adjacent watersheds.

EXHIBIT E

We, the undersigned, wish to express our attitude toward the BIG BLACK RIVER, MISSISSIPPI COMPREHENSIVE BASIN STUDY as follows:

We are very definitely interested in the overall development of the River Basin with specific interest being upon the land and land use of this river basin. We feel that there is potentially some of the most productive land in the state of Mississippi in this river basin. We would like to propose an improvement in the river which would consist of channel realignment and enlargement of the Big Black River. We would propose that this channel enlargement begin at the outlet of the Big Black River and proceed upstream to approximately West, Mississippi. We propose that a floodwater retarding structure be installed at West, Mississippi, so as to protect the thousands of acres of highly productive bottomland within the river basin. We feel that this would greatly improve the river basin as a whole, that it would also offer better outlets for the small watershed projects being carried on in this river basin and that the installation of this floodwater retarding structure would supply water and water related needs to this particular area. We would very definitely be opposed to any type of structural measures that would influence the Big Black River to flood any lands from a point at West, Mississippi, to its outlet on the Mississippi River. We do not believe that it would be necessary for any type of water impounding structure to be installed along in this area because we now have available the Pearl River Reservoir and ground water which could be utilized by the drilling of wells. We like to think of the Big Black River Basin as strictly an agricultural region. We think that this Basin is best suited for the production of agricultural crops. We thank you for your consideration in this matter.

| | |
|---------------------|-----------------|
| Madison Goodell | Atkins |
| H. J. Watson | W. S. Roberts |
| T. D. Ranch | Thomas L. James |
| G. J. Watson | W. S. Roberts |
| R. W. Phillips | |
| James Smith | T. H. Redden J. |
| R. J. Anderson | M. Ross Smith |
| W. H. Anderson | Jan Redden L. |
| John B. Stephenson | W. H. Hayes |
| John B. Stephenson | J. D. Smith |
| J. K. Boyd | M. H. Smith |
| E. J. Harris | |
| D. O. Stegall | James C. Cook |
| Bill H. Cook | J. H. Smith |
| L. L. Childman | Henry Williams |
| Douglas C. Chambers | Lennie McLean |
| Contra Mrs. | |
| Wm. H. Miller | Contra Mrs. |
| Wm. H. Miller | |
| J. K. Smith - 1893 | Contra, Mrs. |
| W. J. Clark | Madison Mrs. |

EXHIBIT F

CANTON Chamber of Commerce
we're on the GO in CANTON*

POST OFFICE BOX 202 • CANTON, MISSISSIPPI • 601 / 859-1606

NOVEMBER 17, 1964

LIEUTENANT COLONEL JAMES E. BETTS
CORPS OF ENGINEERS
VICKSBURG, MISSISSIPPI

DEAR COLONEL BETTS:

THE BOARD OF DIRECTORS OF THE CANTON CHAMBER OF COMMERCE
HAS ASKED ME TO FORWARD TO YOU THE ATTACHED RESOLUTION REGARDING
THE BIG BLACK RIVER COMPREHENSIVE STUDY WHICH WAS PASSED ON
NOVEMBER 17, 1964.

THE BOARD FURTHER ADVISED ME TO MAKE THEIR REQUEST THAT
THE RESOLUTION BE MADE A PART OF THE PERMANENT FILE ON THIS
SUBJECT.

YOUR COOPERATION IN THIS MATTER IS CERTAINLY APPRECIATED.

SINCERELY,

CANTON CHAMBER OF COMMERCE

Tom C. Maynor

TOM C. MAYNOR
EXECUTIVE SECRETARY

TCM:AB

EXHIBIT F

*Agriculture *Business *Industry *Recreation

RESOLUTION

WE, THE BOARD OF DIRECTORS OF THE CANTON CHAMBER OF COMMERCE, WISH TO EXPRESS OUR ATTITUDE TOWARD THE BIG BLACK RIVER, MISSISSIPPI COMPREHENSIVE BASIN STUDY AS FOLLOWS:

WE ARE VERY DEFINITELY INTERESTED IN THE OVERALL DEVELOPMENT OF THE RIVER BASIN WITH SPECIFIC INTEREST BEING UPON THE LAND USE OF THIS RIVER BASIN. WE FEEL THAT THERE IS POTENTIALLY SOME OF THE MOST PRODUCTIVE LAND IN THE STATE OF MISSISSIPPI IN THIS RIVER BASIN. WE WOULD LIKE TO PROPOSE AN IMPROVEMENT IN THE RIVER WHICH WOULD CONSIST OF CHANNEL REALIGNMENT AND ENLARGEMENT OF THE BIG BLACK RIVER. WE WOULD PROPOSE THAT THIS CHANNEL ENLARGEMENT BEGIN AT THE OUTLET OF THE BIG BLACK RIVER AND PROCEED UPSTREAM TO APPROXIMATELY WEST, MISSISSIPPI. WE PROPOSE THAT A FLOODWATER RETARDING STRUCTURE BE INSTALLED AT WEST, MISSISSIPPI, SO AS TO PROTECT THE THOUSANDS OF ACRES OF HIGHLY PRODUCTIVE BOTTOMLAND WITHIN THE RIVER BASIN. WE FEEL THAT THIS WOULD GREATLY IMPROVE THE RIVER BASIN AS A WHOLE, THAT IT WOULD ALSO OFFER BETTER OUTLETS FOR THE SMALL WATERSHED PROJECTS BEING CARRIED ON IN THIS RIVER BASIN AND THAT THE INSTALLATION OF THIS FLOODWATER RETARDING STRUCTURE WOULD SUPPLY WATER AND WATER RELATED NEEDS TO THIS PARTICULAR AREA. WE WOULD VERY DEFINITELY BE OPPOSED TO ANY TYPE OF STRUCTURAL MEASURES THAT WOULD INFLUENCE THE BIG BLACK RIVER TO FLOOD ANY LANDS FROM A POINT AT WEST, MISSISSIPPI, TO ITS OUTLET ON THE MISSISSIPPI RIVER. WE DO NOT BELIEVE THAT IT WOULD BE NECESSARY FOR ANY TYPE OF WATER IMPOUNDING STRUCTURE TO BE INSTALLED ALONG IN THIS AREA BECAUSE WE NOW HAVE AVAILABLE THE PEARL RIVER RESERVOIR AND GROUND WATER WHICH COULD BE UTILIZED BY THE DRILLING OF WELLS. WE LIKE TO THINK OF THE BIG BLACK RIVER BASIN AS STRICTLY AN AGRICULTURAL REGION. WE THINK THAT THIS BASIN IS BEST SUITED FOR THE PRODUCTION OF AGRICULTURAL CROPS. WE THANK YOU FOR YOUR CONSIDERATION IN THIS MATTER.

NOVEMBER 17, 1964

BOARD OF DIRECTORS

CANTON CHAMBER OF COMMERCE

TRANSCRIPT OF PUBLIC HEARING

ON

BIG BLACK RIVER, MISSISSIPPI

COMPREHENSIVE BASIN STUDY

MONTGOMERY COUNTY COURTHOUSE

WINONA, MISSISSIPPI

3 MAY 1967

DEPARTMENT OF THE ARMY
VICKSBURG DISTRICT, CORPS OF ENGINEERS
VICKSBURG, MISSISSIPPI 39180

Public Hearing
on
Big Black River, Mississippi
Comprehensive Basin Study

Montgomery County Courthouse
Winona, Miss.
3 May 1967

The Vicksburg District, Corps of Engineers, held a public hearing in Winona, Mississippi, to discuss the comprehensive study on the Big Black River. Colonel Felix R. Garrett, District Engineer, called the hearing to order at 1400 hours.

PRESENT:

VICKSBURG DISTRICT, CE

Colonel Felix R. Garrett, District Engineer
Mr. J. B. Middleton, Chief, Basin Planning Branch
Mr. John Anderson, Technical Liaison Officer
Mr. V. C. Ahlrich, Chief, Special Studies Section
Mr. Jimmy Graham, Special Studies Section
Mr. Richard Stuart, Special Studies Section
Mrs. Laura B. Emrick, Basin Planning Branch

OTHERS PRESENT:

Mr. Melvin B. Allen, Economist, Economic Research Service, U. S. Department of Agriculture, Box 3319, Jackson, Miss.
Mr. H. H. Bagwell, County Supervisor, Eupora, Miss.
Mr. G. G. Bennett, retired farmer, Vaiden, Miss.
Mr. J. R. Boyd, farmer, Kilmichael, Miss.
Mr. Sidney Branch, Vice President, Big Black River Basin Development Association, Rt. 1, Winona, Miss.
Mr. Hembree Brandon, Editor, Winona Times, Winona, Miss.
Mr. J. W. Braswell, Supervisor, Beat 5, Montgomery County, Kilmichael, Miss.
Mr. Joe F. Brooks, Choctaw Co., Mathiston, Miss.
Mr. John T. Brown, Recreation Resource Specialist, Bureau of Outdoor Recreation, 810 New Walton Bldg., Atlanta, Ga.

Mr. Terry Brown, Landowner, Stewart, Miss.
 Mr. P. H. Brown, Farmer, Indianola, Miss.
 Mr. A. R. Burford, Assistant State Conservationist, Soil Conservation Service, P. O. Box 610, Jackson, Miss.
 Mr. Roy Campbell, Supervisor, Holmes Co., Durant, Miss.
 Mr. A. P. Carroll, Farmer, Lexington, Miss.
 Mr. James P. Cating, Acting Chief, Vicksburg Office, Federal Water Pollution Control Adm., P. O. Box 1217, Vicksburg, Miss.
 Honorable J. P. Coleman, Judge, Ackerman, Miss.
 Mr. James H. Collins, Employee, U. S. Department of Agriculture, Kilmichael, Miss.
 Mr. Theodore S. Cook, Planner, Mississippi Research and Development Center, 787 E. Lakeland, Jackson, Miss.
 Mr. Richard A. Cooper, County Agent, Miss. Extension Dept., Carrollton, Miss.
 Mr. Holmes Curtis, Farmer, S.C.D., Winona, Miss.
 Mr. P. R. Daly, Area Conservationist, Soil Conservation Service, no address.
 Miss Claire Davis, Executive Vice President, Rivers and Harbors Association, New Capitol, Box 1309, Jackson, Miss.
 Mr. J. M. Dean, Farmer, Weir, Miss.
 Mr. R. B. Ellison, Project Engineer, Miss. State Highway Dept., Box 188, Winona, Miss.
 Mr. Euell L. Dickard, Office Manager, Webster County ASCS, USDA, Box 72, Eupora, Miss.
 Mr. S. R. Evans, Greenwood, Miss.
 Mr. A. J. Ferguson, Retired Landowner, Vaiden, Miss.
 Mr. J. M. Field, Farmer, Rt. 2, Mathiston, Miss.
 Mr. L. H. Flurry, Work Unit Conservationist, Soil Conservation Service, Winona, Miss.
 Mr. C. H. Fondren, Farmer, Stewart, Miss.
 Mr. Wallace G. Fortner, Farmer, Rt. 2, Eupora, Miss.
 Mr. T. E. Foshee, District Construction Engineer, Mississippi Highway Department, Batesville, Miss.
 Mr. C. W. Gary, Farmer, Eupora, Miss.
 Mr. John W. Gary, Eupora, Miss.
 Mr. J. O. Gary, Farmer, Eupora, Miss.
 Mr. J. W. Gary, Jr., Farmer and Merchant, Eupora, Miss.
 Mr. O. C. Gary, Farmer, Eupora, Miss.
 Mr. W. D. Gary, Attorney for Board of Supervisors of Webster County, Miss. and Board of Mayor and Aldermen, Eupora, Miss., Box 577, Eupora, Miss.
 Mr. Clyde Gibson, Superintendent of Education, Montgomery County Schools, Kilmichael, Miss.
 Mr. W. T. Greenlee, Farmer, Kilmichael, Miss.
 Mr. Burdett Greenlee, Farmer, Kilmichael, Miss.
 Mr. H. L. Hambrick, Farmer, Vaiden, Miss.
 Mr. Henry H. Hanisee, Vicksburg Field Office, Federal Water Pollution Control Adm., P. O. Box 1217, Vicksburg, Miss.
 Mr. W. L. Heard, State Conservationist, Soil Conservation Service, P. O. Box 610, Jackson, Miss.

Mr. A. D. Hitt, Retired, Eupora, Miss.
 Mr. Pascal Hodges, Supervisor, District 1, Webster County, Eupora, Miss.
 Mr. W. E. Howell, Druggist, Durant, Miss.
 Mr. Julius K. Johnson, Farmer, no address.
 Mr. Wayne Johnson, Supervisor, Webster County, and Director, Big Black District, Mantee, Miss.
 Mr. Frank Jones, Farmer, Kilmichael, Miss.
 Mr. Mark Boykin Keller, Lawyer, Member of Board of Supervisors of Carroll County, Peachahala Water Management District, Box 203, Carrollton, Miss. and Box 87, Vaiden, Miss.
 Mr. John A. Killebrew, County Agent, Winona, Miss.
 Mr. M. L. Landrum, Farmer, Box 272, Eupora, Miss.
 Mr. W. C. Landrum, Lumberman, Farmer, Alderman, Durant, Miss.
 Mr. J. P. Love, Farmer, Tchula, Miss.
 Mr. Jimmy Love, McAdams, Miss.
 Mr. Rives B. Lowrey, Project Forester, Yazoo-Little Tallahatchie Flood Prevention Project, U. S. Forest Service, Box 270, Winona, Miss.
 Mr. J. B. Majure, Work Unit Conservationist, Soil Conservation Service, Lexington, Miss.
 Mr. R. Dale McBride, Banker, Peoples Bank of Durant, Durant, Miss.
 Mr. Kenneth D. McCall, Regional Coordinator, Department of the Interior, P. O. Box 1467, Muskogee, Oklahoma
 Mr. L. E. McCullough, Asst. to Div. Engr., I.C.R.R., Central Station, Memphis, Tenn.
 Mr. W. H. McKenzie, Jr., Treasurer, Big Black River Assn., Peoples Bank of Durant, Durant, Miss.
 Mr. J. T. McMin, Work Unit Conservationist, Soil Conservation Service, Ackerman, Miss.
 Mr. Lagrone Mortimer, Executive Vice President and Cashier, Bank of Kilmichael, Kilmichael, Miss.
 Mr. James E. Nail, County Agent, Extension Service, Box 597, Eupora, Miss.
 Mr. W. C. Neill, President, Peoples Bank and Trust Co., North Carrollton, Miss.
 Mr. Roy Newcome, Jr., Hydrologist, U. S. Geological Survey, P. O. Box 2052, Jackson, Miss.
 Mr. Dan Oakes, Farmer, Box 239, Kosciusko, Miss.
 Mr. C. D. Oakes, Supervisor, Rt. 2, Vaiden, Miss.
 Mr. E. E. Parks, Biologist, Bureau of Sport Fisheries and Wildlife, 817 Crawford St., Vicksburg, Miss.
 Mr. Clarence Pierce, State Legislator, Carroll and Attala Counties, Vaiden, Miss.
 Mr. J. D. Randall, Farmer, Rt. 2, Eupora, Miss.
 Mr. Robt. K. Ray, Insurance Agency owner and Member, Chamber of Commerce, no address.
 Mr. Rae Sanders, BOR Coordinator, Mississippi State Park System, 1102 Woolfolk Bldg., Jackson, Miss.
 Mr. O. W. Scott, Farmer, Montgomery County Soil Conservation District Commissioner, Duck Hill, Miss.
 Mr. George D. Scruggs, Biologist, Bureau of Sport Fisheries and Wildlife, Atlanta, Ga.

Mr. Donald A. Simpson, Work Unit Conservationist, Soil Conservation Service, Carrollton, Miss.
 Mr. G. W. Stephenson, Member, Board of Supervisors, Ackerman, Miss.
 Mr. A. J. Sugg, Rt. 2, Eupora, Miss.
 Mr. J. E. Sullivan, Farmer, Winona, Miss.
 Mrs. Sallie Sullivan, Housewife and Farmer, no address.
 Mr. Edmond I. Swensen, Forester, U. S. Forest Service, Jackson, Miss.
 Mr. D. E. Swindall, Farmer, Rt. 2, Mathiston, Miss.
 Mr. Hugh Tatum, Associate Planner, Mississippi Research and Development Center, 787 East Lakeland Dr., Jackson, Miss.
 Mrs. Homer Tompkins, Kilmichael, Miss.
 Mr. George E. Townsend, Engineer-in-Charge, River Basins, Federal Power Commission, 819 Taylor St., Ft. Worth, Texas
 Mr. J. V. Trussell, Farmer, no address.
 Mr. Luther W. Wade, Farmer and Livestock Business, Box 288, Greenwood, Miss., and Vaiden, Miss.
 Mr. John W. Wakefield, Federal Water Pollution Control Adm., Atlanta, Ga.
 Mr. Claude A. Walker, Work Unit Conservationist, Soil Conservation Service, P. O. Box 231, Eupora, Miss.
 Mr. B. E. Wasson, Hydrologist, U. S. Geological Survey, Box 2052, Jackson, Miss.
 Senator Arnie Watson, State Senator, Carroll and Montgomery County, North Carrollton, Miss.
 Mr. R. H. Wells, Soil Conservationist, Soil Conservation Service, Jackson, Miss.

COLONEL GARRETT: Good afternoon, ladies and gentlemen. I am Colonel Felix Garrett, the District Engineer for the Corps of Engineers. For almost 2½ years now, the Federal and State agencies concerned with water resources development have been engaged in a comprehensive study of the Big Black Basin. Our work is now practically complete and we have arranged this public hearing in order that we may present to you our findings and obtain your comments on these findings before we prepare our final report. Now, a Coordinating Committee composed of representatives of the Governor and representatives of the various Federal Departments engaged in this study have served as an advisory group in guiding the investigation. I am a member of this Coordinating Committee and I would like at this time to introduce the other members of the Committee and have each of them introduce members of their staff.

The Governor's representative is Mr. Sam Hailey. He could not be with us at this hearing today.

Next, we have Mr. Kenneth D. McCall, who represents the Department of the Interior.

MR. McCALL: Thank you, Colonel. The Department of the Interior is also represented by a number of people. Mr. John Wakefield of the Atlanta Regional Office of the Federal Water Pollution Control Administration; Mr. Jim Cating and Mr. Henry Hanisee of the Vicksburg Field Station, Lower Mississippi River Basin Comprehensive Water Pollution Control Project; and Mr. John Brown, Atlanta Regional Office, Bureau of Outdoor Recreation; Mr. Billy Wasson and Mr. Roy Newcome of the Jackson, Miss., District Office, U. S. Geological Survey; Mr. George Scruggs of the Atlanta, Ga., Regional Office, Bureau of Sport Fisheries and Wildlife; and Mr. Gene Parks of the Vicksburg River Basins Office, U. S. Sport Fisheries and Wildlife.

COLONEL GARRETT: Thank you very much, Mr. McCall. We have Mr. George E. Townsend representing the Federal Power Commission. We also have Mr. R. J. MacConnell representing the Department of Commerce, who was unable to be with us today. Mr. R. W. Chapman represented the Department of Health, Education and Welfare, and he was unable to attend today. Mr. W. L. Heard represents the Department of Agriculture.

MR. HEARD: I also represent the Soil Conservation Service as State Conservationist and as such, the Chairman of the Departmental Field Advisory Committee made up of the member agencies, the SCS, Forest Service, and ERS. We have with us today several members of the Department I would like to present. First is Mel Allen with the Economic Research Service of the Department of Agriculture; Ed Swensen, U. S. Forest Service. On my immediate staff, A. R. Burford, Assistant State Conservationist; Ray Wells, Watershed Basin Party Leader; and Buck Daly, Area Conservationist in this part of the State. I see some members of the Soil Conservation District but I shall not take the time to present them.

COLONEL GARRETT: Thank you very much, Mr. Heard. Now I would like to introduce the members of the Vicksburg Engineer District staff who are here with me today. First, we have Mr. J. B. Middleton, Mr. Pinky Ahlrich, Mr. Jimmy Graham, Mr. Richard Stuart, and Mr. John Anderson, and also we have Mrs. Laura Emrick who is recording this meeting.

I would also at this time like to express my appreciation to the Montgomery County officials for the use of these facilities and specifically to Mr. Sidney Branch, Vice President of the Big Black River Development Association, for making arrangements for this meeting today.

We propose to divide the meeting into four parts. First, we propose that each member of the Coordinating Committee will describe the role of his agency in this comprehensive study and the results of their investigation in determining the needs of the basin itself. Next, we will describe alternative projects which have been considered, and third, we will invite interested organizations and individuals that are here today to enter statements into the record as to their reaction to the plan which we will present. These statements may be presented either orally or in writing or they may be turned in after the public hearing, but I would ask that they be turned in prior to the 20th of May of this year. Finally, in the fourth part of the hearing I would like to open the floor to

questions and answers which I and members of the Coordinating Committee will try to answer.

As you came through the door, you received attendance cards which had a place for your name and your organization and you were asked to indicate on it whether you intended to make a statement or not. If you have not received such a card I would like for you to hold your hand up at this time and we would like to pass one out to you.

As I indicated earlier, we are here today to present to you our findings of the study of the Big Black and receive your views on these findings. This will help us to formulate a recommendation as to which of the alternatives, if any, should be recommended for construction. We are holding public hearings at both Winona and Canton and we intend that the matters presented by the Coordinating Committee at these two hearings to be identical. Therefore, the only difference in the hearings will be the presentations made by the local people.

Now, let us take a brief look at the objective of this study of the Big Black River Basin. The primary purpose of the investigation was to determine both the present and future needs for water and related land resources in the basin and formulate the best plan that could meet these needs. A major part of our studies involved identifying these needs and listing those projects which could be constructed to satisfy them. During the course of the study, we considered the needs for water supply, waterborne navigation, flood control, outdoor recreation, fish and wildlife, pollution abatement, hydroelectric power, land stabilization measures, and watershed protection and management measures.

Now, I would like to invite your attention to the slide here on the right. Big Black River Basin comprises approximately 3,300 square miles. It is 155 miles long and averages about 22 miles in width. Numerous tributaries of almost equivalent size thoroughly dissect the area, entering the main stem at fairly even intervals throughout the length of the river itself.

The basin is agriculturally oriented with a great deal of crop land being located along the bottoms of both the main stem and the tributaries of the river. Bottom lands along the main stem comprise about one-tenth of the total drainage area. In developing a plan of improvement for the basin our studies were not limited to the main stem or the valley section of the basin itself, but extended to the drainage divide that separates Big Black from the Yazoo Basin on the north and west and the divide that separates it from the Pearl River Basin on the south and the east.

In the initial step of the investigation we determined both the present needs and the needs that will exist within the basin by the year 1980. These requirements were then extended 50 years into the

future, or until the year 2015.

As I pointed out earlier, this investigation pooled the professional resources of most of the Federal and State agencies that are responsible for some phase of water resources development. At this time I would like to call on each agency to give you a brief synopsis of their particular agency's study and the results of their investigation to determine the basin needs. A little later on in the meeting I will ask them to present the projects which were investigated to meet these needs. First, I would like to call on Mr. Bill Heard, representing the Department of Agriculture and the Soil Conservation Service.

MR. HEARD: With your permission, Colonel, I want to take about a minute here and dwell just briefly on the history leading up to this study, which I think will be appropriate to get the whole picture of this thing. On December 12, 1961, the Big Black and Southwest Rivers Development Association met in Jackson to consider the water problems of the southwestern part of the State. This meeting was attended by several hundred leaders of the area, by members of Congress and of the Legislature. Keep in mind that this was following the authority that the Department of Agriculture had acquired earlier to make an inventory study of the Pearl River Basin. This group wanted to get in on that study. As a result, a request was made to the Mississippi Board of Water Commissioners to have the sponsoring State agency include the Big Black Basin and the independent streams of south Mississippi in the inventory study to be sponsored by them and carried out by the Department. Subsequently, a similar request was received from representatives of southeast Louisiana through the Louisiana Department of Public Works. On October 29, 1962, I was granted authority by Administrator D. A. Williams of the Soil Conservation Service to proceed with this massive study to take in all of the southwestern area of Mississippi and southeastern Louisiana. This work was actually begun and plans were made, a staff was set up, but this was interrupted by subsequent Congressional authorization for comprehensive river basin planning to be carried on concurrently in the Pascagoula River Basin, the Big Black River Basin, the Pearl River Basin, with activities deferred on the independent streams in southwest Mississippi and Louisiana. As the Colonel has pointed out, we collectively are now in the final phases not only of the Big Black Basin but also of the Pascagoula Basin, with completion of these other two studies scheduled for completion next year.

Now, the U. S. Department of Agriculture, through the agencies of the Soil Conservation Service, Forest Service, and Economic Research Service, has welcomed the the opportunity to work with the Corps of Engineers and other agencies and departments of the State and Federal Government in seeking to find in a coordinated manner suitable answers to the basic resource problems of this basin. For our Department, we

expect to describe the problems and needs and recommend solutions in a Departmental report which will contain essentially a plan that has been determined to be technically and economically feasible, although we do not claim has been adjusted to the views of local sponsoring organizations that must represent local watershed groups in a program to install measures and construction to help solve the problems in a given sub-watershed. The provisions of Public Law 566, under which our part of this planning is done, and which our watershed work is carried out, makes this step mandatory. Now, to get to the needs.

The conclusion from the study, of course, is that this basin is and will remain in the foreseeable future an agricultural area. It is on the basis of this that most of our needs have been determined.

Reads statement, Exhibit A.

COLONEL GARRETT: Thank you, Mr. Heard. I would like to call on Mr. George Townsend, representing the Federal Power Commission.

MR. TOWNSEND: Colonel Garrett, ladies and gentlemen. Reads statement, Exhibit B.

COLONEL GARRETT: Thank you very much, Mr. Townsend. I would like at this time to call on Mr. John Wakefield. Mr. Wakefield is with the Federal Water Pollution Control Administration. He will be making a presentation on behalf of the Department of Health, Education and Welfare and the Federal Water Pollution Control Administration.

MR. WAKEFIELD: Thank you, Colonel Garrett. Ladies and gentlemen. As the Colonel has pointed out, he just named two of the hats I am wearing today. Actually, I am wearing three. One of those is speaking for the Department of Health, Education and Welfare, at their request, which is not too inappropriate because the agency that I am assigned to was in the Department of Health, Education and Welfare a year ago. We were transferred out of the Department of Health, Education and Welfare into the Department of the Interior about February of 1966. Also the agency that I am assigned to, the Federal Water Pollution Control Administration, and the U. S. Public Health Service, the agency of the Department of Health, Education and Welfare, that is immediately concerned with the particular subject we are talking about today, are very closely allied on a number of matters, particularly that of public water supply. The Public Health Service is concerned with about anything that affects the health and welfare of individuals and of course collectively as public health.

In these river basin studies they are particularly interested that water supplies are adequate in amount, and for this they have asked the Federal Water Pollution Control Agency to be their agent and they are also vitally concerned with the safety of these public water supplies. To that extent the three agencies cover the same ground because we, too, are concerned about the adequacy of water for whatever use is made of it.

The Public Health Service is also concerned about vector control. By that we mean anything in the way of insects, in some cases snails in rivers might carry disease (not in this area, may I hasten to add) and so on. External agents that move the germ from one place to another that would affect public health. Now in these river basin studies, for example, we are particularly concerned with mosquito control. Unfortunately, Public Health Service was not included in the study of the Big Black River Basin for vector control, partly I presume because when the study got started the now Federal Water Pollution Control Administration was the Division of Public Water Supply and Pollution Control in the Public Health Service. In the shuffle, in separating these two units, the vector program got dropped by the wayside. However, this does not mean that it will be neglected because in the detail planning stage of any projects that are undertaken, the Public Health Service will be involved and will take their regular part in planning the projects to see that vector control is cared for.

Another item that Public Health Service is vitally concerned about which I don't think is a concern in the Big Black, it's not impossible but I don't think it is, this is shell fish sanitation. Of course, they would be particularly concerned about this along the sea coast where there would be oysters. It is possible in fresh water that there might be some concern about clams but if there are any in this region I don't know anything about it. If you know, you have something on me. This, then, is my first hat. I am speaking now for the Public Health Service of which I am no longer a member but a close associate.

The second hat that I would like to put on now is as director of the Southeastern Comprehensive Water Pollution Control Project. This is an agency of the Federal Water Pollution Control Administration, one of a number of such agencies, for the development of comprehensive programs to control or eliminate pollution, and this is by the direction of Congress. The Southeastern Comprehensive Water Pollution Control Project is carrying on a concurrent study with this water resource study that is being coordinated by the Corps of Engineers. The same data is useful in both studies. The difference will be something like this. In the Big Black Basin, I am going to talk in a few minutes about our findings on the streams, but there are cities and industries in the basin that need improvement in water pollution control. The Project will be directly interested in coming in and working with these cities and industries as well as with the State that will be working right with us, in order to develop alternatives by which these can be corrected. In the coordinated water resources project, however, we are assuming that these treatment methods have been applied, that the best has been done by the cities and industries and individuals and we then talk about what needs to be done over and above this individual treatment process. We will be back in touch with many of you in this comprehensive water pollution control project, because we will want to be working with the individual communities and committees of citizens to develop these needs and finding ways of correcting them.

Now I come to putting on the third hat. This is representing the Federal Water Pollution Control Administration in this coordinated water resource study. I would like to discuss the needs that we have developed. First, I would like to point out that these needs are based on uses of water that have largely been developed for us by the members of the Big Black Basin Development Association. We asked them to serve as ex-officio members of our water use committee and they very graciously agreed and they have worked with us. We have also had the advantage of advice by the Mississippi Water and Air Pollution Control Commission which I believe no longer exists but at the outset of this project consisted of the heads of the various departments concerned with water resource development. These two groups have advised us and given us the local approach and desires. We were told at the outset that the over-riding desires of the people of this basin are to develop industry and, if possible, facilities for wet industries and at the same time, protect fish and wildlife. In the projections our economists have made, in addition to the economic studies made for all of us by contracts with the Corps of Engineers, we have failed to find justification for extensive wet industries. We do find that there will be an increase in employment of something like 50 percent of what it is now during the 50 years or more that we have projected. But this presumably would be dry rather than wet industry.

Our studies have shown that there is sufficient water in the main stem of Big Black River to take care of this projected 50 percent increase in employment and something like 100 percent increase in population without low-flow augmentation. What I'm getting at is that the critical period in temperature and flow, so far as water pollution is concerned, is in the hot dry summer months. This is the period in which we make our studies and this is the period which we project the load in order to see if there is enough water there to take care of conditions under the most critical conditions. We found that there is enough water in the Big Black to take care of this projected growth, as I said, 50 percent in employment and 100 percent in population in the next 50 years, without storing any water to be used for low-flow augmentation in the main stem. Again, this is predicated on adequate treatment of all municipal and industrial waste in the basin.

We find a deficiency in the tributary streams along the river. For example, just picking one out of the group, there is a tributary stream where the city of Canton is located. Canton is up on a ridge in an area where the stream is very small where it starts. That stream is inadequate for treated waste, even after the best reasonably good treatment is provided. We know of no projects proposed by the Corps of Engineers that would provide low-flow augmentation for that stream and for these other streams. There are, however, the Soil Conservation Service projects that are proposed and will be discussed later that, if we could provide storage in those projects for low-flow augmentation, it would be very advantageous for the communities and

industries located on those tributary streams. At the present time, this has not been authorized by Congress, and the only way that storage could be included in those projects is for non-Federal agencies to pay for that storage. We are going to strongly recommend to you that you people of this basin investigate the possibility of buying storage in these water conservation projects for this purpose - to provide low-flow in the summertime.

On the subject of water supply, we find that the ground water is adequate to provide water supply for municipalities and for industries under projected conditions for the next 50 years. We do not have any recommendation to make for storage of water for this purpose. Thank you.

COLONEL GARRETT: Thank you, Mr. Wakefield. I would now like to call on Mr. John Brown, representing the Bureau of Outdoor Recreation.

MR. BROWN: Thank you. Reads statement (Exhibit C, pages 1 through 3).

COLONEL GARRETT: Thank you, Mr. Brown. Our next speaker will be Mr. Billy Wasson, representing the U. S. Geological Survey.

MR. WASSON: Congress has charged the U. S. Geological Survey with the responsibility for the appraisal of available water in river basins, and in areas where the project crosses basin lands. This includes mapping the aquifer framework, determining chemical and physical qualities of water resources, interrelation of surface and ground water, and water requirements for industrial, domestic, and agricultural needs, and providing scientific and technical assistance in the hydrologic field to other Federal agencies. I would now like to give you a short summary of the water availability report that the U. S. Geological Survey has made on the Big Black River Basin.

Our study in the Big Black River Basin has shown an abundant supply of good water is available from either surface water or ground water sources. For 90 percent of the time flow in the lower part of the Big Black River below Pickens is greater than 85 cubic feet per second and minimum flows are greater than 5 cubic feet per second in five of the eastern tributary streams in the upper half of the basin. Quality of surface water is excellent except for minor organic pollution from municipal waste and brine pollution from several oil fields in the lower part of the basin.

Most of the available ground water is contained in six geologic units: the beds of the Cretaceous Age, Wilcox, Meridian, Sparta, Cockfield, and Catahoula formations. The aquifers dip gently toward the southwest and they overlap to the extent that a well drilled to the base of fresh water will in most places penetrate two or more aquifers. Well depths range from 10 to 2,400 feet; in other words, from springs to real deep wells.

In several areas, fresh water extends deeper than 2,500 feet. The yellow areas there indicate the depth of fresh water. But near the mouth of the Big Black River brackish water is encountered only about 300 feet below land surface.

Practically all water presently pumped for man's use in the basin is from the ground. This amounts to about 11 million gallons per day. However, a small amount of surface water is used to supplement irrigation of row crops. Wells producing 500 to 1,000 gallons per minute are common in the basin. Most of the area is underlain by one or more aquifers from which a properly constructed well could produce as much as 2,000 gallons per minute. Well fields from these aquifers may produce more than 10 million gallons per day. There would have to be several wells spread out. Base flow of the streams that produce ground water overflow or discharge will not be significantly affected by heavy pumping from artesian aquifers. However, heavy pumping from shallow aquifers to provide irrigation supplies could significantly reduce the base flow of some streams. That is about all we will go into right now. Thank you, Colonel.

COLONEL GARRETT: Thank you, Mr. Wasson. Mr. George Scruggs, representing the Bureau of Sport Fisheries and Wildlife.

MR. SCRUGGS: Thank you, Colonel. Reads statement (Part 1 of Exhibit D).

This constitutes the needs segment for fish and wildlife. The details of our study are contained in our Agency report. Thank you.

COLONEL GARRETT: Thank you very much, Mr. Scruggs. Now I would like to summarize briefly the participation of the Corps. Initially, we determined the needs within the basin for flood control and navigation improvements. Then we compiled these needs with those as determined by each of the other participating agencies and investigated projects which would satisfy those needs. We found that floods occur in the Big Black River Basin rather frequently and damages are prevalent throughout the entire basin. Bottom lands along the main stem of the river incur approximately two damaging floods a year during the crop-growing season, and under existing conditions some 45,000 acres are inundated annually, with an average annual flood damage of approximately \$240,000. Agricultural damage, most of which is to crops, constitutes about 90 percent of these losses. Principal highways and railroads on the main stem are above the flood level, and the timber industry incurs only minor flood losses.

As for navigation, presently we find there is no need for a navigable waterway within the Big Black Basin proper. However, with the trade activity and the industrial activity in the Jackson area, there is a need for water transportation into Jackson. If the present industrial growth in this area continues, the demand for water transportation

may increase in the future to the point that a navigation channel linking Jackson area with the Mississippi River could become economically feasible. Now, this very briefly covers the Corps' participation in the development of the needs of the basin itself. Now let us take a look at the projects that were considered in formulating a plan of development for the Big Black River Basin. First, I would like to call on Mr. Ray Wells to discuss the projects which the Department of Agriculture studied.

MR. WELLS: You have been very patient here for about an hour. Would you like to take a little break and stand up and stretch?

Three-minute intermission

During the course of this discussion, Mr. Ed Swensen with the U. S. Forest Service will make reference to the river basin map on the screen to my right. You will notice that there are three different shades of green and yellow on the map. He will point to the map as I talk about some of these watersheds.

As Mr. Heard indicated, the Department of Agriculture's activities were primarily centered in the upstream watershed of the Big Black Basin. Within the Big Black Basin we have delineated and identified 37 upstream watersheds. Reads statement (Sections III, IV, and V of Exhibit E).

COLONEL GARRETT: Thank you, Mr. Wells. Now, I would like to ask Mr. Jimmy Graham to come forward and briefly discuss the plan of improvement considered by the Corps and our findings.

MR. GRAHAM: As was pointed out earlier, analysis of the basin's water and related land resource needs indicated deficiencies in satisfying both the immediate and long-range needs for flood control, power and recreation, with a need for navigation into the Jackson area developing in the future. Projects which we have considered were separated into two categories: (1) those projects needed by the year 2020, and (2) those projects needed by the year 1980.

We considered 4 types of improvements, (1) major impoundments; (2) improvement of stream channels; (3) construction of levees; and (4) development of recreation facilities.

Briefly I will describe each of the plans which we have considered.

As you can see on this slide (indicating) we studied two reservoirs on the main stem of the Big Black River. One was in the vicinity of Durant, Mississippi, and the other was just north of Edwards.

Our next plan, as you can see here (indicating) on this plan,

consisted of a series of loop levees along the main stem of the Big Black. These are small levees which would tie into the hill line and protect localized areas of 1,000 to 2,000 acres.

We next considered providing for flood protection by channel improvement and enlargement. The first channel enlargement plan would have contained the 3-year May to October frequency floods within banks. The second plan would have contained the annual May to October frequency flood within banks. The third channel improvement plan which we considered was to clear and snag the existing river.

Each of these channel improvement plans was also studied in connection with the Soil Conservation Service's plan which Mr. Wells described. Each of these green dots represent the flood water retarding structures of the SCS.

We next looked at a system of 17 reservoirs which would be located on streams tributary to the Big Black River. By itself, no one reservoir would control enough of the drainage area to provide any flood protection. However, as a total unit these 17 reservoirs would control approximately 28 percent of the total drainage area of the basin. This would provide some flood protection to the bottom lands along the main stem of the river. You might note that while these reservoirs are providing some flood protection along the main stem they are taking out of production some of the most fertile agricultural lands within the basin. That is these lands lying along the tributary bottoms.

These reservoirs (indicating) were also studied in connection with the Soil Conservation Service's plan. As you can see on this slide, those SCS structures which are located upstream from the reservoirs were eliminated. For example, on Seneatcha Creek, you might note that there are now no SCS structures, whereas on a previous slide, the SCS plan of development provided 11 structures in this watershed. These structures were eliminated because the reservoir would inundate the tributary lands which the 11 SCS structures are designed to protect.

Finally, we investigated the possibility of providing a navigable waterway linking Jackson to the Mississippi River. This slide shows 4 possible routes for such a canal. All of these routes would require a system of several locks and dams and partial diversion of flows from the Pearl River to maintain flows in the canal. Preliminary studies indicate that at the present time, the cost of either of these plans would be considerably more than the transportation savings which would be realized.

Briefly, this covers the plans which the Corps of Engineers has investigated.

Of all the plans which we have considered, the only plan which

could be economically justified is the tributary reservoir plan. These reservoirs were investigated as multipurpose projects combining flood control and recreation as project purposes. However, the flood control part was not found to be economically justified and could not be included as a project purpose.

These reservoirs then would be serving purely a recreational purpose. I might point out that under existing laws, the Corps of Engineers cannot construct a single-purpose recreational project. However, there are programs under which the Federal Government will share in the cost of a single-purpose recreational project.

These reservoirs would take out of production some of the most fertile agricultural lands within the basin, and it does not appear that they would meet the overall needs of the basin. We, therefore, are not recommending these reservoirs for construction at the present time. However, these reservoirs or an alternate to them should be considered in the future, as the basin develops, as a means for meeting these needs.

COLONEL GARRETT: I would now like to call on Mr. John Brown who will discuss the projects that the Bureau of Outdoor Recreation considered.

MR. BROWN: Reads statement (pages 4 and 5 of Exhibit C).

COLONEL GARRETT: Thank you very much, Mr. Brown. I would like to call on Mr. George Scruggs to discuss the projects of the Bureau of Sport Fisheries and Wildlife.

MR. SCRUGGS: This segment of my statement constitutes the evaluation of the proposed projects for early action that have been proposed by the Soil Conservation Service. Reads statement (part 2 of Exhibit D).

COLONEL GARRETT: Thank you very much, Mr. Scruggs. That completes the formal presentation of the findings of this comprehensive basin study. I would like at this time to recognize the presence of Judge J. P. Coleman in the audience. It is a pleasure to have you with us, Judge Coleman. Now at this time, I would like to receive statements that anyone would like to make for the record. As I indicated earlier, these statements can be made in writing or they can be made orally. If you have a statement that you would like to have entered into the record, I would ask that you submit these statements to us prior to the 20th of May, 1967. I recognize this is a fairly early date, but we would like to have the record complete so that we can finalize our report. First, I would like to call on those people who have indicated on the registration card that they would like to make a statement. Mr. Sidney Branch, of the Big Black River Basin Development Association.

MR. BRANCH: Speaking for the Big Black River Basin Development Association, I would like to make this statement. Reads statement (Exhibit F).

COLONEL GARRETT: Thank you very much, Mr. Branch. Mr. P. H. Brown of Indianola, Mississippi.

MR. BROWN: I don't care to make a statement.

COLONEL GARRETT: All right, sir. Thank you. Miss Claire Davis, Executive Secretary of the Rivers and Harbors Association of Mississippi.

MISS DAVIS: I am not going to make a full statement at this time. However, we continue to offer our assistance. We are most grateful for this study and I feel that this is a great step forward. We will continue to work with the people.

COLONEL GARRETT: Thank you very much. Mr. W. D. Gary indicated he would like to make a written statement. Is that correct, Mr. Gary?

MR. GARY: Yes, that is correct.

COLONEL GARRETT: All right, fine. Mr. J. P. Love from Tchula, Mississippi.

MR. LOVE: First, I would like to commend the report that we have heard. It is quite concise and, of course, it is a far-reaching program, one that will mean much to us from the standpoint of farming and other operations, particularly that of meeting our demands by 1975 as indicated by the Governor and other agencies of the State, from 1965 through 1975. I appreciate this because it is the first opportunity that I have had to hear any part of the discussion. The early discussion, if I got a notice I missed it. If it was published, I still missed it. I am primarily interested in the whole basin, and I think it is a fine program. I think, with a few alterations, this will find the full cooperation of all of us. As for the balance of what I have to say, I think it would be more appropriate because it is more or less on a personal basis regarding some of the facets of this work, I would prefer to give a written report or to meet with the local group and discuss my problems with them.

COLONEL GARRETT: Thank you, sir. Mr. O. W. Scott has indicated he would like to make a statement.

MR. SCOTT: Mine will be mighty short, gentlemen. This is a joint statement between the directors of the Big Black Watershed or rather, River Basin, and the Montgomery County Soil Conservation District. We endorse this program 100 percent and recommend the carrying out of this program as presented here today. We base our opinion on the

past experience we have had with the Bogue Creek Watershed and also three watershed projects under the Public Law 566. Benefits that have been derived from these projects make us enthusiastic in recommending the completion of this Big Black. Thank you. (Hands statement to Col. Garrett, Exhibit G.)

COLONEL GARRETT: Thank you, Mr. Scott. Mrs. Sullivan, did you want to make a statement?

MRS. SULLIVAN: I just want to say, everyone has made a complete report. I think it fully satisfies me. I will have a suggestion that I will send you in writing, just a suggestion. Women love to make suggestions, that is only natural. I will check with my local board and talk with them. Everything has gone off just beautifully.

COLONEL GARRETT: Thank you very much, Mrs. Sullivan. Now, those are all the cards in which people have indicated they wanted to make a statement. Would anyone here like to make a statement for the record at this hearing? I would like to ask you to identify yourself, sir, and who you represent.

SENATOR WATSON: I am Senator Arnie Watson. I have the privilege of representing two counties adjacent to the Big Black River and which, of course, are included in this program. I think I speak for all the people when I say we deeply appreciate the beneficial and informative program which you gentlemen have delivered so efficiently and I think we have a better understanding of this program. I indicated on my card that I did not necessarily want to make any remarks. The thought has come to my mind as I listened to you gentlemen that, as a representative of these two counties in the Mississippi Senate, and I believe we have some other legislators here who are interested in the program, I can readily see that we are at the top of the ladder now. The Judge and all of us begin at the bottom and go up. But you have us at the top now and we've got to come back down to these little bottom land farmers and try to sell them on the program. We could tell them to get their fishing tackle and guns and dogs and boats and get on the poverty program and forget farming, but we can't do that because they are not going to agree to it. We legislators have already had some experience. We realize that there have got to be some changes made in some of the laws that we have on our Mississippi statutes in paying for this program. It has been brought to our attention plainly and even some of the members of the legislature realize, personally, there have got to be some changes made. I am sure that you will be getting some of those statements in writing. I don't intend to send any written statements, but anything I can do to help sell the program to the farmers that are going to be affected, I am sure that I will do it. All of you people who are here will have to help us pass the story on to the small farmers that will be affected.

We will have to go back to the dictionary and learn the definition of some of these words we heard this afternoon, like hydroelectric, and wet industry and megowatts. Those are three things that I am sure those farmers are not going to digest readily and we will just have to get the dictionary and explain those things to them and try to have this program as near ready as possible when you reach us again. I have enjoyed it and I am sure it has been a pleasure to all of us. Thank you.

COLONEL GARRETT: Thank you very much, Senator. Are there any other statements that anyone would like to make at this time? Will you identify yourself, sir.

MR. LANDRUM: I am W. C. Landrum. I didn't come here to make a speech, but Mr. McKenzie on our Board here, handed me this envelope and said hand it in and say anything you can. I don't have anything written so I'm liable to say most anything. I am a member of the Board of Aldermen of Durant. The Industrial Council, Lions Club. Rotary Club are represented here. Everybody in Durant is greatly interested in this program. We have already begun to get organized and we are interested in every aspect that has been mentioned. We are also interested in farming, you mentioned dry industry and wet industry. We are interested in one of those just half-way between. In any way that we might help out, count on every individual in Holmes County to be of any help. Thank you. (Hands in statement, Exhibit H.)

COLONEL GARRETT: Thank you very much, sir. Are there any other statements at this time? Again I want to say, if you would like to submit a written statement, please submit it to us by 20th of May, 1967. All right, at this time, if there are no further statements, I would like to open the floor to questions. If you have a question, please raise your hand. Claire?

MISS DAVIS: I just have one question concerning the outdoor recreation area. What was the consideration, if any was given to outdoor recreation, as far as a boatway on the Big Black River is concerned? As far as access roads, areas that could be used, approach ramps, etc.

MR. BROWN: Consideration was given to improved access but none in the form of a boatway such as has been considered on the Pearl. Flow in the Big Black is a problem. Low-flow augmentation is needed for a lot of boating in much of the river. Of course, in the lower part there is quite a bit of water. This has presented some problems in the capability of the present program to provide this low flow. To answer your question specifically, about the only thing you are talking about that was considered was access in the present program that would be available to fishermen. Probably they would get the most use out of it. Right now, and I stand to be corrected by Mr. Wells,

but in the 566 program, storage can not be included in these reservoirs for low-flow augmentation. This particular program would rule it out. Whether or not there would be changes in the future is up to someone else.

QUESTION: As I understand these projections, the Soil Conservation Service plan will be put into effect first and in the future if further reservoirs for recreation or other purposes are found to be feasible, they will be installed then. Is that correct?

COLONEL GARRETT: That is basically our recommendation. Yes, sir.

MR. BRANCH: One or two questions, sir. In carrying out or implementing the plan as presented here today on these programs, is it not going to be primarily up to the local organization or groups representing the local people to initiate action to get this program going and get it on its feet?

COLONEL GARRETT: I would like to call on Mr. Heard to answer that.

MR. HEARD: Essentially, that is right, Mr. Branch. I presume you are referring to the statement Mr. Wells made about the broad intention to implement the 22 watersheds. I anticipated that this question would come up and, if you will bear with me for about five minutes, I will dwell on this, with the understanding that you will accept this as a tentative authorization because you are touching on an area here that we are still trying to work out. Actually, in this phase of the program or programming, program development, whatever you want to call it, the Administrator has said that he will consider recommendations for seeking authorization of these activities of the project on an individual basis. There is no blanket policy that makes it automatic that this will be carried out immediately. I think you ought to understand then, that our statement here is simply a recording of our intentions to carry this to the attention of the Administrator and to recommend to him that this course of action be followed. I think you might have in your mind then, what does this mean? If this is done, first of all we would have to have the approval of the plan as has been mentioned here today within the Department and between the agencies that have been involved in this coordinated effort. That, I think, will be forthcoming. Then we would have to have assurance from the local interests that the plan meets the need of the basin and that would be where you would come in with your association, and your organization, and that it is essentially acceptable within the basin. Not necessarily with respect to the dotting of every "I" or the crossing of every "T" but that it meets the essential needs and is therefore essentially acceptable. Keep in mind that some adjustments would have to be made later. Then the Administrator would refer this to the Secretary of Agriculture and he would say yes or no or "I'll submit this to the Bureau of the Budget" and if he agreed

he would submit it to the Bureau of the Budget and they would look it over because they would be dealing here with a new means of providing funds for this type of an accelerated program. Assume that the Bureau of the Budget ultimately, after some prodding I expect, would say "O.K. We'll go along with it." Then it would have to go to designated committees in the Congress, that is in the form of resolutions. And favoring this, these committees would consider these resolutions and they would say yes or no. If they said yes, then the resolution would follow the accustomed parliamentary procedure and be considered by the Congress. If not, it would be dead. But, if it were passed, the resulting action would be an authorization for the Department of Agriculture to request that funds be appropriated to carry out essentially the plan as contained in the report. In other words, it would be not an appropriation document but an authorization document. Now keep this in mind, repeating again what I said a while ago, that the net effectiveness would be that funds would be considered by the Bureau of the Budget as a line item for Big Black River Basin, whereas, now we get all our money in one wad and it is parceled out. Now, this would be a line item and a certain amount of funds might be included there but then, if the same procedure is followed that was followed in the 11 authorized flood prevention projects, of which we have two in this state, then these funds would be allocated when a subwatershed had been prepared according to the standards and procedures required by Public Law 566. We can't get away from that. The rules that govern 566 are going to be in effect on this and this, of course, insures that a procedure that has been well tested will be continued in this area. Does that answer your question, Mr. Branch?

MR. BRANCH: Yes, sir. There is one point I would like to make. The way I see this flood prevention, the flood control situation in the Big Black from its overall standpoint is this: That the specific jobs or specific projects that will most effectively do the job to control the flooding in the main stem of the Big Black are the very ones that will do the job in the small watersheds. Let me go back at it this way - let me turn my question around - if we eliminate the flood damage in the upstream - in the small watershed program - we will have essentially done a big part of the job in eliminating flooding in the main stem of the Big Black. Is that correct?

COLONEL GARRETT: The primary purpose of course, in the upper watershed program, is to protect those lands in the tributary area itself. There are some \$2,000,000 worth of benefits there. There were also some \$400,000 worth of benefits that would be realized as a result of the structures in the upstream on the main stem. However, this is not the solution to the flood problems on the main stem. Actually, the situation is such, however, that the plans that we considered for flood protection on the main stem were just not economically justified at the present time. That is the situation in the basin.

MR. HEARD: So that there will not be any misunderstanding about this part, I want to concur publicly in your statement, sir.

COLONEL GARRETT: Are there any other questions? Mr. Love.

MR. LOVE: Pardon my second get-up. I would like to direct this question to Mr. Heard, please. Do you think the present organizational setup of the local districts is the kind that we should have?

MR. HEARD: Are you referring to the local water management districts?

MR. LOVE: I am referring to the beginning, when your district is organized. When you go before your Chancery and ask that you have trustees appointed to manage this district, do you think that is done in the right manner today?

MR. HEARD: In most cases, I would say it has worked very effectively. It may vary by groups in the way they go about their business or perhaps even with counsel in the way they are advised to conduct their business. Essentially, with 135 of these in existence in the State today, Mr. Love, I would say the success would favor this type of organization.

MR. LOVE: I have been a staunch supporter of all the reports and all the work done by the Soil Conservation work, but there are some changes that seem would be necessary if all of the people are to understand this, what's going on. In my case and I am going to speak personally, if you please, because I think there are a great many in here who are affected by this, I didn't know anything about my involvement in this one watershed until the engineers were working on my land, with no notice whatsoever. Is that a good practice?

MR. HEARD: I would say this is not a desirable practice.

MR. LOVE: Is it done very much?

MR. HEARD: No sir, it is not. This happening in your particular case is an exception.

MR. LOVE: Do you know why it was done?

MR. HEARD: I presume that the local group thought they had an understanding about it.

MR. LOVE: Well, I had reference, of course, to so many times the complaint has come to us--the Senator has already referred to it--in cases where we are absolutely in the dark until everything is done. I have never had a neighbor to mention to me anything was going on. And yet some of the land involved that I have, and this is my

report that I will make later, since 1959 when this district was organized, and living in that community, neighbors or no one informed me of the fact and let me spend thousands and thousands of dollars on useless land to build it and then come up here at this late date and begin a survey without my knowledge of the thing at all.

MR. HEARD: This, Mr. Love, is just exactly the reason in 1955, Judge Coleman was Attorney General when this law was amended by Senate Bill 1220, the committee that was working on this matter favored this course of action because of the fact that the drainage laws to which this was tied, carried provisions for the local commissioners keeping in touch with the local landowners and the local interests and this, frankly, was the reason that I favored this sort of approach, and I think it should be done in every case.

MR. LOVE: I am questioning only the method by which you go, not the end result that you try to obtain. But I think local people should be notified and discussed and don't get a committee down the creek always. And that's the committee that we are looking forward to. Appointed by courts, they request it, you can't blame the court from putting him on there as a committeeman, but at the same time, he doesn't represent the man that's got to go under water. He should be heard and we have not been heard on these questions. Now, I want to repeat this statement, I want to say definitely that my specific case doesn't have anything to do with the whole thing, but make some small compromise and there would be no question here. But at the same time, the policy is rather crude and it seems to me that it should be changed. It should be definitely done in the near future to keep down a whole lot of trouble in these drainage districts that are so badly needed.

MR. HEARD: I agree with you 100 percent.

MRS. SULLIVAN: Mr. Heard. Did I understand you to say that they would have to have an easement before they came on your property?

MR. HEARD: No. Ordinarily, we operate on the basis of the local governing body obtaining a permission, this is the access right to go on and make surveys. This should be done in all cases.

COLONEL GARRETT: Yes, sir, Judge Coleman.

JUDGE COLEMAN: I do not live, of course, in the Big Black watershed, but I live in a county which has a very vital interest in it. I live in the Pearl River watershed, as far as that part of it is concerned. But after hearing all this discussion this afternoon, I wonder if this report that we are compiling will be put in writing and will be circulated where those of us who are here will have an opportunity to see it later and to know more about what is in it. For

example, what I have in mind, the gentleman who made the very able report about the watersheds talked about numbers but didn't name any of them and I don't know any more now than I did when I came as to what he may be thinking about--Bywy or McCurtains or some of the watersheds up in my county.

MR. HEARD: Judge, there will be, actually, two reports. One will be a report that will be made and published by the Corps of Engineers which will be a composite report for the whole activity. This, I understand, will be duplicated and distributed in sufficient numbers to serve what you propose there. In addition, we propose to do the same thing for the report that we prepare. It will be printed and, I don't know how many copies we have set up, but it will have widespread distribution.

JUDGE COLEMAN: Thanks. If I understand it correctly, the Corps of Engineers is more or less bowing out of this matter. They say that nothing they could do on the Big Black would be economically feasible in the way of flood control, if I understood the gentlemen correctly. So it seems to me that Soil Conservation is going to have to carry the ball from now on.

MR. HEARD: With the exception of the final report. This does not excuse, I believe, Colonel, the Corps from proceeding with the compilation of the final report.

COLONEL GARRETT: That is correct, sir. When this study was set up, the comprehensive study was set up, we were designated to be in charge of the field representatives, the Corps was, in order to co-ordinate the activities of all the agencies here to arrive at this comprehensive study. And so, what we will get and publish ultimately for the entire group, this will be a summary report and that will go forward. And each agency in turn will prepare their own individual report for their organization and it will be available for you to look at.

JUDGE COLEMAN: Did I understand you correctly now, you find that no form of flood control on the main stem is economically feasible at this time.

COLONEL GARRETT: That is correct.

JUDGE COLEMAN: So consequently we get back out to the tributaries, and that is going to be a Soil Conservation function. Of course, those of us who love the soil and want to preserve it and improve it, we are going to be looking very intently as to what our Soil Conservation leaders recommend. Will it be altogether covering up somebody's land to save somebody else's or will we have some drainage in places where we really need drainage instead of lakes and ponds. That will all be in your report, won't it, Mr. Heard?

MR. HEARD: Yes, it will.

JUDGE COLEMAN: Thank you very much.

COLONEL GARRETT: Are there any other questions?

MRS. SULLIVAN: Is it true that you can carry this project with only 40 percent of the dams?

MR. HEARD: I don't believe I understand the question, Mrs. Sullivan.

MRS. SULLIVAN: This project can be carried by building only 40 percent of your dams?

MR. HEARD: No, ma'am. I don't believe that's necessarily true. There may be some of these individual subwatersheds in which lesser dams can be justified or the project may be feasible with fewer dams but to say that 40 percent of the dams are not necessary out of the 135, I think this would not be accurate.

MRS. SULLIVAN: I am the lady who killed Hays Canal.

MR. HEARD: Frankly, I did not research Hays Canal, but this really is not a problem.

COLONEL GARRETT: Are there any other questions?

MRS. TOMPKINS: When will we know both as communities and individuals what lands and what streams will be affected by this?

COLONEL GARRETT: Are you in a position to answer this question, Mr. Heard?

MR. HEARD: I don't believe this will be known until the local group organizes and decides they want to go ahead with the project.

MRS. TOMPKINS: Well, will these groups--will they consult us about this?

MR. HEARD: These will be the type of groups that Mr. Love was talking about.

MRS. TOMPKINS: Well, we have been very interested in it because, you know, when you might be put under water--well, I don't want to move but I don't think I can grow fins.

MR. HEARD: Well, I think that all we can say at the present time is, we have come up with some conclusions on some individual projects by examination of some sites. We have decided that these projects are

economically and physically feasible but, as we stated before, we do not claim that they necessarily meet the wishes and desires of local interests. This must be obtained before the project is carried through.

MRS. TOMPKINS: These are recommendations?

MR. HEARD: That is right. I would say they are recommendations of the type of project that would be needed.

MRS. TOMPKINS: Well, I just suggest your recommenders, they investigate this real good before they decide on it, the local people, I mean. Thank you very much.

COLONEL GARRETT: Thank you, ma'am. Are there any other questions? Ladies and gentlemen, we appreciate your interest and courtesy that you have shown us here today. I think we have had a good meeting and I want to thank you very much for your hospitality. Thank you.

EXHIBIT A

BIG BLACK RIVER BASIN
PUBLIC HEARING

Winona and Canton, Mississippi
May 3 and 4, 1967

WATER AND RELATED LAND RESOURCE PROBLEMS AND NEEDS
AS IDENTIFIED WITH UPSTREAM WATERSHEDS

The problems of the land are many and real. The solution to many problems can be achieved through local, State and Federal cooperation. Solving some problems will depend upon local initiative and resources.

Erosion

Erosion, while still a serious problem, is less intensive now than in the past. Sheet erosion is moderately to severely active on over 300,000 acres of cropland and over 500,000 acres of pastures. The land in forest poses a lesser problem. There are about 20,000 acres of forest land and over 59,000 acres of open land that need critical area stabilization. Erosion is moderate to severe on about 1200 miles of roadbanks.

Floodwater

There are over 275,000 acres of land subject to overflow in upland watersheds. The total direct annual damages from flooding is \$2,300,000. Of this amount about \$2,000,000 is damages to crops and pastures, over \$127,000 damages to minor fixed improvements on farms and over \$218,000 are damages to public roads and bridges. Damages to urban and industrial areas are relatively insignificant.

All or parts of 32 watersheds in the Basin have land and water problems that naturally affect the use, management and production of crops and pastures. Five watersheds in the lower part of the Basin are affected to a lesser extent. Within the 32 watersheds over 258,000 acres of floodplain lands are inundated on an average of three to four times during the growing season.

Sediment

Deposition of sediment is a relatively minor problem throughout the Basin as a whole. It does, however, contribute to flooding by filling stream channels, thereby causing added damages to crops, pastures and fixed improvements. A great amount of sediment enters the stream system from extensive gullied areas or from eroding roadbanks.

Impaired Drainage

Most of the channels in the upland watersheds have sufficient capacity to carry runoff from normal precipitation. In many instances, however, complete water disposal systems have not been constructed because of the frequency of flooding in bottom lands. Over 435,000 acres of land in the Big Black Basin have a drainage problem. Of this amount, 248,000 acres are open land in crops and pastures and the remaining 187,000 acres are in forests. The estimated average annual reduction in net income from inadequate drainage of open land is about \$1,800,000.

Flood Control and Prevention Needs

Studies made in upland watersheds indicate an immediate need for flood prevention measures. The first need is for land treatment measures to be applied on those lands where erosion is a problem. Structural measures needed in conjunction with land treatment measures to further reduce flood damages include 186 floodwater retarding structures, 17 multiple-purpose structures, and 937 miles of channel improvement in the 32 feasible upland watersheds.

Irrigation

The average rainfall for the Study Area is approximately 50 inches. However, lack of sufficient soil water during the growing season reduces yields and often causes crop failure. The immediate problem in the Basin is not sufficient gross annual rainfall, but inadequate frequency and distribution of rainfall during the growing season. The need for project-type irrigation measures was not considered to be feasible in the Basin at this time; however, irrigation may be profitable to individual farmers and specialized crops.

Other Problems and Needs

Water for rural domestic household and livestock uses is not a problem insofar as supply is concerned. Adequate ground water is available from wells, springs and streams in all parts of the Basin.

The Department of Agriculture River Basin report will identify problems and needs relating to fish and wildlife, recreation, and pollution.

However, participating agencies with responsibilities in these fields will make reports at these hearings.

EXHIBIT B

Role of the Federal Power Commission and Findings on Needs for Hydroelectric Power in the Big Black River Basin

Introduction

The Fort Worth Regional Office of the Federal Power Commission has developed the hydroelectric power needs of the Big Black River Basin and has cooperated with the Vicksburg District of the Corps of Engineers in its screening studies of the potential hydroelectric projects. The need-resumé I will present is based on our report furnished on March 28, 1967 to the District Engineer, Vicksburg District. The data presented will show (1) hydroelectric needs in 1980, and (2) needs in the years 2000 and 2020. Also to be described will be items considered in the derivation of the hydroelectric power needs.

Needs in 1980

We have developed data showing the need for 4,260 mw of hydroelectric power in 1980 in FPC's Study Area K. I will tell you about the Study Area K in just a moment. Of this amount, 2,670 mw could be in pumped-storage hydroelectric capacity and would include 1,520 mw proposed or now under construction in Area K. This indicates that additional pumped-storage capacity would be needed in 1980 in the amount of 1,150 mw. Conventional hydro capacity in 1980 is needed in the amount of 1,590 mw. If it were economical to do so, some of the above noted capacity could be installed in the Big Black River Basin and included in the comprehensive basin plan for the next 10 to 15 year period.

Presented on May 3 and 4, 1967 by George E. Townsend, Engineer-in-Charge,
River Basins, Fort Worth Regional Office, Federal Power Commission

Needs in 2000 and 2020

The next important conclusion developed concerns the long range possibilities for hydroelectric installations. Potential hydro capacity which could be supplied in Area K in the year 2000 is 14,260 mw, and in the year 2020 is 29,660 mw. Of these amounts 6,920 mw in the year 2000 and 13,540 mw in the year 2020 could be in pumped-storage hydroelectric capacity (including the 1,520 mw proposed and now under construction). From what we know of the potential conventional power sites in the Big Black River Basin and the rest of Area K, even if they were all economically and financially feasible to construct, they are not enough to meet the projected demand. In the Basin, conventional sites are sparse, and pumped-storage sites are non-existent.

Background

Aside from the projected needs, you should know something of the criteria and background on the derivation of results.

The Market Area

Federal Power Commission Coordination Study Area K, which comprises essentially the area served by the Southwest Power Pool and associated systems, has been designated as the power market area for hydroelectric power from Big Black River Basin projects. Area K includes all of the States of Arkansas and Louisiana and parts of the States of Kansas, Oklahoma, Missouri, Texas, and Mississippi. Consideration is given to inter-regional transfers with the Tennessee Valley Authority on the eastern side and the Department of the Interior on the northern side of Area K.

Past and Estimated Future Power Requirements

The peak demand in Study Area K is expected to grow from 13,070 mw in 1965 to 35,900 mw in 1980 as documented in the National Power Survey. This estimate has been extended to the year 2020 for this study at which time the peak is expected to reach 182,000 mw.

Power Supply

Both Study Area K and the Big Black River Basin are served by utilities representing all segments of the industry. The entire area is blanketed by transmission lines ranging from 69-kv to the 500-kv transmission now in service. In Study Area K, the installed capacity as of December 31, 1965 was 16,172 mw which was required to meet the peak demand of 13,070 mw as noted above. A seasonal diversity interarea transfer reaching 2,500 mw before 1980 with the Tennessee Valley Authority is used in power supply analyses. The future power supply will include a number of large steam-electric generating units, several of which currently are in the 500 mw size.

Need for Additional Capacity

An analysis of the existing and expected future power supply in Study Area K indicates that there was a surplus above reserves of 1,534 mw in 1965, and an indicated need for 12,783 mw of additional capacity by 1980. Of this required additional capacity, a portion could be met by hydroelectric capacity.

Existing Hydroelectric Resources

In Study Area K, there are 29 existing hydroelectric projects with

an installed capacity of 3,237.4 mw, including projects under construction and definitely scheduled. None of these are in the Big Black River Basin.

Potential Hydroelectric Resources

Hydroelectric projects have several important advantages over thermal plants in that they do not consume water or fossil fuels, do not contribute to thermal pollution of water or air, have low operation and maintenance costs, can start quickly and meet load changes readily, and provide other corollary benefits. There is a growing need for peaking capacity throughout Study Area K which may be met by projects at potential sites. There are few sites, if any, at which an economical single-purpose conventional hydroelectric project can be constructed. Hydroelectric power, both conventional and pumped-storage, however, can be developed as a function of a multiple-purpose project in comprehensive basin developments.

Portion of Future Load Which Could be Supplied by Potential Hydroelectric Projects

Monthly load duration curves for 1980, 2000, and 2020 have been developed for Area K which demonstrate the utilization of existing and under-construction hydroelectric projects and the maximum hydroelectric capacity that can be utilized in the peak load month, usually in August.

Summary

Summarizing, by 1980 the load shape is expected to be able to

accommodate potential new hydroelectric capacity amounting to 4,260 mw of which 2,670 mw could be pumped-storage hydroelectric capacity. This 2,670 mw includes a total of 1,520 mw for projects proposed or now under construction and leaves 1,150 mw of new pumped-storage capacity for development by 1980. Similarly, for the year 2000, the load would accommodate new hydroelectric capacity totaling 14,260 mw of which 5,400 mw could be new pumped-storage capacity. For the year 2020, corresponding figures would be 29,660 mw and 12,020 mw. The amount of needed capacity is greater than the amount of conventional capacity available at the potential sites. This concludes the summary of overall power needs in the Big Black River Basin.

EXHIBIT C

Statement By
Bureau of Outdoor Recreation at
Public Hearings at Winona, Mississippi, May 3, 1967
and Canton, Mississippi, May 4, 1967

Agency Role and Findings

The Bureau of Outdoor Recreation, through its Southeast Regional Office in Atlanta, began its participation in the Big Black Comprehensive River Basin Study in July 1964.

The role of the Bureau in this study was to investigate and evaluate the existing and potential outdoor recreation resources within the Big Black River Basin study area, which presently, or may in the future, provide outdoor recreation opportunities. The Bureau also assisted in the evaluation and formulation of the recreation aspects of water and related land resource development projects considered for construction in both early-action (1980) and long-range (2015) action programs.

Our recreation study of the area included an inventory of existing public outdoor recreation areas and an identification and evaluation of potential resources and developments which may provide recreation opportunities in the future. Consideration was given to the active recreation use of developed resources as well as to the preservation, protection, and potential development of the basin's undeveloped resources.

The study evaluated the present types of recreation activities and the extent of participation in these activities. It also projected

future outdoor recreation demand by selected activities and groups of related activities. Needs for land and water areas and facilities to accommodate the projected demands were estimated.

The Bureau's findings in the study are grouped into Demand, Supply, and Needs. Recreation demand is defined as a measurement of the amount and kinds of outdoor recreation facilities and activities the public desires. Supply is an appraisal of the capacity of the existing areas and facilities to meet the demand. Needs are the amount of resources and facilities necessary to meet the unsatisfied demand.

Demand for the activities of swimming, boating, camping, picnicking, canoeing, and other activities was calculated for 1965, 1980, and 2015. The total annual recreation demand was estimated at nearly 7 million recreation days in 1965, almost 11 million recreation days in 1980, and over 35 million recreation days in 2015. The demand for recreation is greatest in the southern one-half of the basin, as this is the area of greatest present population and projected population growth. This area is also influenced by the Jackson Standard Metropolitan Statistical Area.

The public and private supply, as of 1965, of existing recreation resources and facilities in the study area was also determined. The public supply was projected to 1970 by considering presently programmed additions to public recreation facilities. No method was available to project the private supply.

In 1965, facilities existed in the basin study area that were capable of accommodating about 570,000 recreation days of use annually for the four major activities of swimming, boating, camping, and picnicking. For 1970, the supply is expected to increase to a point that will accommodate about 670,000 recreation days use for these four major activities.

Needs for outdoor recreation resources and facilities were determined by comparing the existing and projected supply of recreation facilities with the existing and projected demand for such facilities. A need for additional boating water and camping, picnicking, and swimming facilities exists for 1965, and this need becomes much greater in the target years of 1980 and 2015.

In 1965, a need for facilities to accommodate over 1 million recreation days of use for the activities of swimming, boating, camping, and picnicking existed. In 1980, the unsatisfied demand is projected to be in excess of 2 million recreation days annually, and in 2015, over 9 million recreation days annually for the activities dependent on or enhanced by water.

Projects Considered

To meet this need for recreation resources and facilities, which I discussed in the earlier portion of this meeting, various alternatives were considered. They included the expansion of existing recreation areas, improved access to existing resources, and development of new recreation areas.

For the early-action period (1980), much of the need for recreation can be met by expanding two existing recreation areas, the Holmes County State Park and the Choctaw Recreation Area, and by the construction of 17 multi-purpose reservoirs by the Soil Conservation Service. Facilities for swimming, boating, camping, and picnicking can be provided at these areas. Since facilities for boating are the greatest need in the basin, some of these proposed reservoirs will be designed to give boating prime consideration.

In the long-range period (2015), some of the projected annual recreation needs can be met by the expansion of facilities at the early-action projects. These would be the Soil Conservation Service multi-purpose reservoirs, Holmes County State Park, and the Choctaw Recreation Area. In addition, other recreation areas will be needed, particularly those to accommodate the activities of boating and swimming. The six multi-purpose reservoirs in the considered long-range program of the SCS would accommodate many recreation activities with the development of facilities. However, in addition to this, about 13,000 acres of

water would be desirable to provide more opportunities for swimming, boating, camping, and picnicking.

In considering a recreation plan for the Big Black River Basin, the recreation opportunities to be provided by a project in the adjacent Yazoo River Basin have been included. This project would provide a 3,000 acre navigation pool with adjacent recreation facilities. It would also result in a modification of the operation of Sardis, Enid, and Grenada Reservoirs that would enhance the recreation aspects of these areas and result in their providing additional recreation opportunities for the people of the Big Black River Basin.

The Natchez Trace Parkway, part of which falls in the study area, presently provides and will continue to provide recreation opportunities for residents of the basin. The present facilities and the long-range plans for the Parkway have been considered in this recreation study.

It would not have been possible to carry out the Bureau's responsibilities of this comprehensive study without the cooperation of State, Federal, and local agencies and officials. The Bureau expresses its appreciation to these people for their excellent cooperation.



EXHIBIT D

**UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE**

PEACHTREE-SEVENTH BUILDING
ATLANTA, GEORGIA 30323

April 28, 1967

District Engineer
U. S. Army, Corps of Engineers
P. O. Box 60
Vicksburg, Mississippi 39180

Dear Sir:

(Part 1)

Reference is made to your notice of public hearings, dated April 3, 1967, relative to the presentation of the results of the Big Black River Comprehensive Basin Study for the purpose of soliciting the views of all concerned prior to final formulation of the plan of development for the basin.

We appreciate the opportunity to participate in these hearings, and our agency representative will make this statement in behalf of the Bureau of Sport Fisheries and Wildlife. This statement represents a summary of our agency report on fish and wildlife resources of the basin.

The Bureau's participation in the Big Black River Comprehensive Basin Study is authorized under the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). Our study has been conducted with the cooperation and assistance of the Bureau of Commercial Fisheries and the Mississippi Game and Fish Commission.

The Bureau of Sport Fisheries and Wildlife made a determination of the present and anticipated future demand for sport fishing and hunting, based on current and projected population estimates for the Big Black Basin study area. Demand methodology was derived from data extracted from the 1960 National Survey of Fishing and Hunting. Demand for commercial fishery resources produced in the basin was provided by the Bureau of Commercial Fisheries.

The existing and future water and land resources of the basin were inventoried, classified by fish and wildlife habitat type and evaluated in terms of potential resource supply to provide fishing and hunting opportunities.

EXHIBIT D

Based on population projections and per capita participation rates, fishing demand is expected to increase from 606,000 man-days in 1965 to 614,000 by 1980 and 873,000 man-days by 2015. Hunting demand will change from 358,000 in 1965 to 353,000 by 1980 and 464,000 man-days by 2015.

Future fishing and hunting needs represent the difference between resource supply and the demand for opportunities. Determination of the needs or unsatisfied demand provided a base for fish and wildlife planning goals.

The results of our study indicate that sport fishing demand by 1980 within the broad confines of the basin study area can be satisfied by the existing resource supply. However, better distribution of fishery habitat would enhance opportunities in localized sections of the basin. Approximately 35,000 man-days of fishing opportunity will be needed by 2015 in the northern subarea of the basin.

Primarily because of restrictions on use and a low-level of wildlife management on private lands, approximately 14,000 man-days of hunting needs are indicated at the present time in the southern subarea of the basin. Hunting needs will increase to 18,000 man-days by 1980 and 122,000 man-days by 2015.

The annual harvest of commercial fish in 1960 from natural waters was estimated to be 200,000 pounds. Additional requirements are estimated to be 83,000 pounds by 1980 and 201,000 pounds annually by 2015.

(Part 2)

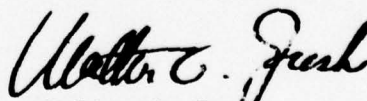
Proposed project development plans proposed by the Soil Conservation Service will materially increase sport fishing opportunities throughout the basin study area and adequately satisfy local fishing needs by 1980 and 2015. The projects will provide 55,000 man-days of fishing by 1980 and 77,000 man-days by 2015. Flood control and drainage project proposals will result in hunting losses caused by inundation of wildlife habitat and the anticipated clearing of woodland habitat in the flood plain. Wildlife losses will reduce potential hunting opportunities by 17,000 man-days. Only slight benefits from waterfowl hunting will occur on the reservoir projects.

The principal elements of our fish and wildlife plan considered for the Big Black Basin are as follows:

1. The multipurpose reservoirs proposed for construction in the early action plan will provide better distribution of fishing opportunities in the basin.
2. A diversity of fishing opportunities should be maintained by preservation and protection from channelization of certain select streams.
3. Improved access development on streams and natural lakes are needed to accommodate an increase in sport fishing, hunting, and commercial fishing use.
4. Suitable wildlife habitat associated with the proposed water development plans should be made available to the Mississippi Game and Fish Commission for intensive management to mitigate project induced wildlife losses.
5. The private sector should be encouraged to recognize the economic importance and other values to be derived by providing public hunting opportunities to help satisfy the critical needs for hunting in future years.
6. Intensified management and utilization of the public lands and wildlife management areas will be needed. Our agency report points out the public hunting potentials offered by the 16th section lands located in the basin.
7. In addition to the need for increased harvest of commercial fish from natural waters, the development of fish-farming operations in the basin may be required to satisfy the future demand for commercial fish production.

The opportunity to present this statement is appreciated.

Sincerely yours,



Walter A. Gresh
Regional Director

EXHIBIT E

SUMMARY REPORT NO. 5
Comprehensive River Basin Study

U. S. DEPARTMENT OF AGRICULTURE

Prepared for
Basin Coordinating Committee
Big Black River Basin
May 2, 1967

EXHIBIT E

Progress Report of the U. S. Department of Agriculture
to the
Basin Coordinating Committee
on the
BIG BLACK RIVER BASIN
May 2, 1967

I. Agricultural Economic Base Study

The Economic Research Service and Forest Service completed an agricultural economic base study of the Big Black River Basin in March 1965.

A brief summary of the data presented in Volume I includes an inventory and analysis of agricultural resources and output in the basin. These data state, in part, that the Big Black River Basin study area comprises approximately 4,339,700 acres. Of this amount, 2,264,417 acres makes up the physiographic drainage area of the basin as evaluated by USDA and as determined by the 1958 Conservation Needs Inventory data.

Agricultural uses of land account for 4,111,000 acres as compared to 228,700 acres devoted to other uses. Less than 1 percent of the total area is surface water. Of the land devoted to agricultural uses approximately 58 percent is forest land, 22 percent cropland, 15 percent pastureland and 5 percent other.

There were approximately 18,900 farms in the basin in 1959. This represents a decline of 10,414 from the 1954 level. An even larger decline was reported for 1949 and 1939. While the number of farms has been decreasing, the size of farms in the basin has been increasing during the past several decades.

The Big Black Basin is made up primarily of miscellaneous and cotton farms. These two types have accounted for more than 80 percent of the farms in the last three census years. Cotton-type farms represented 38 percent of all basin farms in 1959 and indications are that cotton-type farms will decline in relative importance in the future. Livestock farms are the third most important type of farming enterprise in the basin. The leading crops in 1959 in terms of acreage harvested were corn, cotton, hay, soybeans and oats respectively.

Livestock and poultry are also an integral part of agricultural resource use in the basin. Considerable area is used for pasture or grazing of livestock in addition to the sizeable acreage of cropland used to grow feed for animals. There were approximately 375,000 cattle and calves, 146,000 hogs and pigs, 35,000 other livestock in the basin in 1959. In addition, there were also approximately 855,000 chickens and 2,000 turkey hens kept for breeding in 1959.

Some basin farmers derived part of their farm income from the sale of forest products. Pulpwood and sawlogs are the two most important forest products sold. Farms, in addition, benefit from the use of forest products in their farm business. In 1959, approximately 1600 farms reported sales of forest products in the amount of \$1,373,000.

Hired labor is the largest selected farm expenditure and amounted to slightly over \$6,000,000 in 1959. Purchases of livestock and poultry and feed for livestock and poultry represented the second and third largest expenditures in 1959. Approximately \$5,100,000 was spent on the purchase of livestock and poultry and \$5,000,000 was spent for machine hire.

In 1959 approximately 81 percent of the basin farms reported using commercial fertilizer and the basin's use of fertilizer was estimated at approximately 76,000 tons.

The use of supplemental irrigation in the basin as a production practice is limited. In 1954 only 167 farms reported using irrigation on 6,498 acres, compared to 30 farms irrigating 3,176 acres in 1959.

Volume II of the Agricultural Economic Base Study includes projections of agricultural resources in production in the Big Black River Basin for the period 1980 and 2015.

The basin's total population has ranged from 170,000 to slightly over 300,000 from 1870 to 1960. The population was 242,000 in 1960 and is projected to be 248,000 in 1980. In 2015 the total population is forecast to be at a record high of 349,000. The urban portion of this population will increase substantially as well as the rural non-farm sector. The rural farm population, however, is expected to decline through 2015. The rural farm population was 71,000 in 1960 and is forecast to be 31,000 in 1980 and 23,000 in 2015.

A major factor affecting future agricultural production in some areas is the availability of land. Non-agricultural demands for land for such items as highway construction, airports, residential areas and recreational areas tend to reduce the agricultural base used for agricultural production.

Total cropland as well as harvested cropland is expected to decrease in acreage for both future time periods. Pasture and pastured cropland is expected to increase in each of these target years. The crop production in the basin is projected to de-emphasize cotton and corn and place more emphasis on soybeans and hay.

The structure of the agricultural industry in the basin has changed and is expected to continue in the future. Farming has become big business that requires a large capital outlay. It will become more difficult for small inefficient operators to compete with the larger, better organized units. Farmers are becoming more specialized and some are shifting their interest to production of different commodities.

The number of farms in the basin was 18,911 in 1959 and is projected to decrease to 8,800 by 1980 and 7,700 by 2015. The average size of basin farms was 176 acres in 1959. The average size is projected to be approximately 360 acres in 1980 and 380 in 2015.

The average net income per farm is projected to be \$4,800 in 1980 and approximately \$8,000 in 2015. Per capita farm income for 1980 and 2015 is about \$1,400 and \$2,700 respectively.

II. Water Management Analysis

A Water Management Analysis of the Big Black River Basin was completed by the Economic Research Service in June 1966.

The Soil Conservation Service had developed detail studies of water problems for areas within the basin which preliminary investigations indicate to be feasible for project development. However, no attempt has been made to aggregate the available data and develop an economic water management analysis and evaluation for the basin as a whole, irrespective of feasibility potentials.

An attempt has been made to measure the damages which are received through failure to alleviate the basin's water problems, namely overflow, inadequate drainage and drought. This analysis was undertaken without

regard to the feasibility or cost of alleviating these problems. Neither was consideration given to land use changes and land enhancement which might be generated with problem alleviation.

Open land in the floodplain was developed from information by the Soil Conservation Service and the Corps of Engineers. The estimated land in the floodplain provided by these two agencies was 485,600 acres. The Corps of Engineers estimated the main stem area with an overflow problem to consist of 42,500 acres of open land, and 164,000 acres of woodland. There is approximately 158,500 acres of open land and 120,000 acres of woodland in floodplain lands in the upstream portion of the basin.

Conservation Needs Inventory data developed in Mississippi in 1958 presented an estimate of 435,000 acres with a drainage problem and 142,000 acres of irrigable land in the basin. The inadequately drained area was estimated to consist of 248,000 acres of open land and 187,000 acres of woodland. The irrigable land area was estimated to consist of 51,000 acres of open land and 38,000 acres of woodland.

For purposes of ERS analysis the problem was considered to be 201,000 acres of open land with a flooding problem, 248,000 acres of open land with a drainage problem, and 51,000 acres of open land considered irrigable.

Damage to agricultural production caused by flooding is one of the major water management problems in the Big Black River Basin. The attempt here was not to evaluate the benefits which could be received from feasible flood control projects but to determine the total average yearly reduction in net income which occurs with present cropping patterns and farming conditions. The damage to agricultural production as a result of

inadequate drainage was also determined. This analysis did not evaluate the benefits which could be received from feasible drainage projects but attempted to determine the total average yearly reduction in net income due to inadequate drainage which occurs with present cropping patterns and farming conditions. In the Big Black River Basin the average annual reduction in income from flooding on open land is approximately \$1,300,000. The major part of this comes from damages to cropland. The average reduction in net income from cropland with an overflow problem is approximately \$21.00 per acre. The reduction in net income from inadequate drainage of open land is approximately \$1,600,000 annually. The reduction in net income by not using supplemental water on row crops during periods of drought is estimated to be approximately \$121,000 annually. The reduction in net income due to overflow, inadequate drainage or drought is approximately \$2,900,000 a year.

III. Interim Reports

Interim reports on upstream watershed control have been completed on four reaches in the Big Black Basin. There are 37 upstream watersheds in the basin. Each of these has been studied to some degree of detail to determine if they are physically and economically feasible watershed projects. Watersheds were classified as being economically feasible if the annual benefits from flood prevention were at least equal to the cost of those structural measures needed to reduce flooding in the watershed.

Seven watersheds have been planned and are in operation through the PL-566 Watershed Program. Within these seven watersheds 21 floodwater

retarding structures and 61 miles of channel improvement have been completed. There remains to be constructed 25 floodwater retarding structures and 108 miles of channel.

Preliminary indications are that 25 watersheds (over and above the 7 planned and in operation) have been classified as being economically feasible for the next 10 to 15 year period and 5 watersheds as being potentially feasible for the period beyond 1980.

Land treatment measures for all watersheds in the basin are needed on over 560,000 acres of open land and 750,000 acres of woodland.

Critical area measures are needed on 59,478 acres of openland, 19,900 acres of woodland and 1,175 miles of roadbanks need erosion control.

IV. The USDA Plan

The USDA Plan will be that all upstream watersheds determined to be physically and economically feasible will be recommended for Early Action implementation. The authority under which implementation for three watersheds is recommended is the Watershed Protection and Flood Prevention Act, PL-566, 83rd Congress as amended and special basin-wide authority for the remaining 22 watersheds. The three watersheds identified for authorization under PL-566 are Five Creeks Watershed in Yazoo County, Box Creek Watershed in Holmes County, and Apookta Creek Watershed in Attala County. The first draft of the watershed work plan on Five Creeks Watershed was recently completed.

The acres in the seven watersheds that have been planned and in operation are 281,810, the acres of the three watersheds to be recommended

for PL-566 authorization are 188,660, and the acreage for the 22 watersheds that will be recommended for implementation through basin-wide authorization are 1,432,197. There are 361,750 acres in the five watersheds that are potentially feasible.

Land treatment measures were considered as a basic element in formulating all watershed projects and are essential if each is to function properly. These measures are to be planned and applied by individual farmers in cooperation with the respective Soil Conservation Districts in which the watershed occurs. The cost of land treatment measures for watershed protection will be non-Federal while the cost of critical area measures will be cost-shared by non-Federal and Federal interests. The estimated amounts of land needing treatment during the installation period for the 22 watersheds are cropland, 178,647 acres; grassland, 160,184 acres; wildlife lands, 82,885 acres; and woods, 644,111 acres. Grasses and legumes will be planted on 15,780 acres of land as a critical area treatment and over 737 miles of roadside will be treated for erosion control, and 41,130 acres of critical area plantings will be in woods. The total estimated cost for land treatment measures for the 22 watersheds is \$18,408,529.

Floodwater retarding structures was the first choice of structural measures in formulating a plan to reduce flooding in upstream watersheds. There are 137 floodwater retarding structures planned for the 22 watersheds and the estimated cost of installation will be \$14,703,985.

Improvement of stream channels was the second combination of structural measures planned for further reduction in floods and damages to floodplain

lands in upstream watersheds. Channel improvement consisted of snagging and shaping, clearing and snagging and channel enlargement or excavation. Cut-offs and realignment of channels were practically non-existent. Approximately 707 miles of channel improvement are planned for the 22 watersheds and the estimated total cost of installation is \$7,494,970.

Recreation as a project purpose was planned in 12 watersheds. This does not include one multiple-purpose structure for flood prevention and recreation in Long Creek Watershed in Attala County which has been approved for operations. In addition to water storage, basic facilities are to be installed for each structure. Basic facilities will include, but not necessarily be limited to, access roads, boat ramps, swimming beaches, camping and picnicking grounds, electric power, domestic water, and the necessary associated features to provide a well developed, highly attractive outdoor recreation facility. The 15 multiple-purpose structures for flood prevention and recreation are planned for installation in the 22 watersheds at a total estimated installation cost of \$3,700,401.

The total annual benefits from flood prevention and recreation is \$2,536,940. This does not include an estimated annual benefit of approximately \$400,000 that will accrue on the main stem floodplain from proposed works of improvement in upstream watersheds. The average annual cost for flood prevention and recreational facilities is \$1,277,393, for a benefit to cost ratio of 2.0 to 1.0. More than 155,151 acres of floodplain land will be benefited from proposed structural measures in upstream watersheds.

V. Conclusions and Recommendations

The Plan as will be described in the USDA Report is considered the most practical and economically feasible to meet the present and future

needs in upstream watersheds for flood prevention and planned outdoor recreation. The benefit to cost ratio is greater than 1:1 for each watershed. Watershed projects have been coordinated with other agencies and no conflict of interests in projects exist. Local interests will provide the required cooperation necessary in the implementation and construction of works of improvement to be installed. The USDA Field Advisory Committee will recommend that the 22 watersheds as previously identified be authorized for construction through special legislation essentially in accordance with the USDA Plan.

The estimated cost of installing land treatment measures for watershed protection and critical area treatment is \$19,449,347. The estimated cost for installing 137 floodwater retarding structures, 8 multiple-purpose structures, with basic facilities, and 7 multiple-purpose structures without basic facilities, and 707 miles of channel improvement is \$27,554,282. Total project costs is estimated to be \$48,075,915.

Prior to construction of any works of improvement in any of these watersheds, legally constituted Water Management Districts will be organized to furnish assurance to the Secretary of Agriculture that they will meet the requirements of local interests in their share of the installation cost, obtaining necessary easements and rights-of-way and in the operation and maintenance of works of improvement to be installed and as outlined in a detailed watershed work plan and work plan agreement.

The total annual benefits from flood prevention and recreation is estimated to be \$2,536,940. The average annual cost is estimated to be \$1,277,393 with a benefit to cost ratio of 2.0 to 1.0.

EXHIBIT F

THE BIG BLACK RIVER BASIN *Development Association*

Counties Can Speak Through A Basin District

OFFICERS AND
BOARD OF DIRECTORS

G. B. HERRING, CANTON
PRESIDENT
SIDNEY BRANCH, WINONA
VICE-PRESIDENT
W. H. MCKENSIE, JR.
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FLORA
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GOODMAN
RICHARD PARKER
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RICHARD HASTINGS
PORT GIBSON
N. F. YATES
VAIDEN
O. W. SCOTT
DUCK HILL
STEVE BIGGERS
KILMICHAEL
T. H. KENDALL, III
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MANTEE
PASCHAL HODGES
EUPORA
CLARENCE MORGAN
KOSCIUSKO
B. H. MAXWELL, JR.
PICKENS
W. R. FERRIS
RT. 1, VICKSBURG
F. H. EDWARDS
CANTON
JOHN SHARP HOWIE
BENTON
EVERITT HARRISS
VICKSBURG
W. C. NEILL
NORTH CARROLLTON
CAMPBELL GUION
RT. 2, BENTONIA
JOE FRED BROOKS
RT. 2, MATHISTON

CORPS OF ENGINEERS
VICKSBURG, MISSISSIPPI 39180

BIG BLACK RIVER, MISSISSIPPI
COMPREHENSIVE BASIN STUDY

Recognizing that water is our most precious natural resource and is ⁱⁿinnumerable ways a vital part of our everyday lives, the Big Black River Basin Development Association has as its objectives the conservation, utilization and development of the water resources of the Big Black River Basin.

In attempting to attain these objectives we realize that there is no single "best" way to develop a river basin, but rather a number of alternatives with varying and complex effects upon water, soil, plants, and human activity.

We further realize that in order to make a sound approach to water resources development in the Big Black River Basin we must (1) identify these alternatives, (2) analyze them in relation to water-use decisions of the past and (3) to the best of our ability project this analysis into the future.

You have accomplished this in the study presented today. We highly commend all of the agencies participating in this study for your diligent efforts in making it as meaningful as possible. The services you have rendered are in our opinion of inestimable value.

EXHIBIT F

THE BIG BLACK RIVER BASIN *Development Association*

Counties Can Speak Through A Basin District

OFFICERS AND BOARD OF DIRECTORS

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N. F. YATES
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O. W. SCOTT
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EDWARDS

WAYNE JOHNSON
MANTEE

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EUPORA

CLARENCE MORGAN
KOSCIUSKO

B. H. MAXWELL, JR.
PICKENS

W. R. FERRIS
RT. 1, VICKSBURG

F. H. EDWARDS
CANTON

JOHN SHARP HOWIE
BENTON

EVERITT HARRISS
VICKSBURG

W. C. NEILL
NORTH CARROLLTON

CAMPBELL GUION
RT. 2, BENTONIA

JOE FRED BROOKS
RT. 2, MATHISTON

We know that the study presented by you today is not a final plan; it is one step in a continuous planning operation. However, it is the basis or foundation upon which to build our water resources development and without which our program would be severely handicapped.

Our efforts at present are toward creating the Big Black River Basin Development Districts, an agency of the State of Mississippi. It will be representative of the local populace residing within the Big Black River Basin and will be empowered with the authority to plan, coordinate, and implement a comprehensive development program.

To this end we pledge our continued efforts (and urge that you direct yours) toward implementing a program of water resource development in the Big Black River Basin through a coordinated basinwide approach.

Sincerely,

Sidney Branch
Sidney Branch, Vice-President
Big Black River Basin Development Assn.

EXHIBIT G

CORPS OF ENGINEERS
VICKSBURG, MISSISSIPPI 39180

BIG BLACK RIVER, MISSISSIPPI
COMPREHENSIVE BASIN STUDY

We the Commissioners of the Montgomery County Soil Conservation District and the directors of the Big Black River Basin Development Association make this joint statement.

We favor the inclusion in the proposed plan for the management of water in the Basin plans for navigation, water supply, flood control, recreation, pollution abatement, hydroelectric power, irrigation, and fish and wildlife conservation.


Our recommendations are based on experience that we have gained while working with groups in solving water management problems in the Bogue Creek area of the Yazoo River Watershed and three watersheds that have organized water management districts to cooperate with the small Watershed Act 566.

On the basis of our experience we recommend that the proposed plan provide for the full development of the agricultural and forestry potential of the Basin. This can best be accomplished by planning and applying Watershed projects on the tributaries of the river and by improving the River Channel.

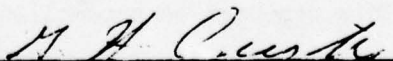
The small watershed type of development has the advantage of reducing flooding by storing water that is available for use throughout the River Basin.

With the small watershed approach on the tributaries of the River the overall short and long range water need throughout the Basin could be planned and established in such a way to solve the problems. Consideration should be given to making full and complete use of the water storage sites, and thus avoid the exploitation of sites that occurs when single purpose structures are used.

It is our belief that by giving first priority to agricultural development, the other needs for water could be included in the program and thus as the flood preventions problem is solved the other water needs may be satisfied.



O. W. Scott, Chairman of Montgomery County Soil
Conservation District Commissioners
Director of Big Black River Basin Association



G. H. Curtis, Secretary-Treasurer Montgomery
County Soil Conservation District Commissioners

EXHIBIT H

Durant Chamber of Commerce

Durant, Mississippi 39063

May 3, 1967

To Whom It May Concern:

In regard to the public hearing to be held May 3rd on the Bib Black River Basin project, we of the Durant Chamber of Commerce are vitally interested in this project.

From the standpoint of farming, water for industrial uses, water for municipal uses and recreation, this project will be most beneficial to the people of the Durant area.

We want to be on record as urging that this project be given the most careful consideration, for we feel that it is vitally needed.

Yours very truly,

DURANT CHAMBER OF COMMERCE

Hugh Carl McLellan
Hugh Carl McLellan,
President

EXHIBIT H

EXHIBIT I

Ackerman, Mississippi
April 28, 1967

To The U. S. Army Engineer District
Vicksburg Corps of Engineers
Vicksburg, Mississippi 39108

Committee on Public Works of the
United States House of Representatives
Washington, D. C.

We wish to advise that at 9 o'clock A.M. on this date, in the Soil Conservation Office, at Ackerman, a meeting was held of the citizens of Choctaw County looking toward the hearings which are to be held at the Courthouse in Winona, Mississippi, on May 2, 1967, relative to proposed improvements in the Big Black River Basin.

Among those attending this session were Judge J.P. Coleman, of the United States Circuit Court of Appeals, native and landowner in Choctaw County, Robert H. Lacey, Bobby Cooper, and J. V. Trussell, large landowners in the County, in addition to such officials of the United States Government as J. D. Burchfield and Les Templeton of the Farmers Home Administration, Horace Long of the State Forestry Commission, and J. T. McMinn and J. M. Dean of the United States Soil Conservation Service.

After full discussion it was the unanimous consensus of the meeting:

1. We unanimously endorse the efforts to improve the Big Black River Basin and pledge our support to it in every appropriate way;

2. With particular reference to Choctaw County we would strongly urge thorough study and appropriate action for the rehabilitation of drainage not only on Big Black itself but in the following tributaries which, in the past, have been canalized, but have fallen into great

Page # 2 -

disrepair for lack of an efficient outlet in Big Black, that is, Big Bywy, Little Bywy, and Middle Bywy. These streams drain one of the most effective, if not the most effective agricultural areas in the County.

Next, McCurtain's Creek, one of the more important tributaries of Big Black, has never been drained. In this particular area of the County there is a special need for retention dams and recreation areas within close proximity to the Natchez Trace Parkway, which crosses McCurtain's at the historic old community of Kenego.

From the Choctaw County standpoint, it must be pointed out that the existing drainage canal on the upper reaches of Big Black, above and below State Highway 9, being North of the old channel, affords no drainage opportunities for Choctaw County land and this situation should be remedied according to best engineering procedures.

Respectfully submitted for
Choctaw County

By: J. T. McMinn
Work Unit Conservationist
Choctaw County, Mississippi

EXHIBIT J

SHELBY ROG CHAIRMAN
JACKSON, MISS
O. A. LATIL JR. VICE CHAIRMAN
BILOXI, MISS
MILTON McMULLAN, SECRETARY
NEWTON, MISS

ROBERT E. FOSTER COM. LLER

W. A. BILBO
MAGNOLIA, MISS
PRIM HAYNES
BELMONT, MISS
WILL A. HICKMAN
OXFORD, MISS
WALTER WILLIAMS
CLARKSDALE, MISS



STATE PARK SYSTEM

1102 WOOLFOLK BUILDING • JACKSON, MISSISSIPPI

May 5, 1967

Colonel Felix R. Garrett
District Engineer
U.S. Army Engineer District
Vicksburg Corps of Engineers
P.O. Box 60
Vicksburg, Mississippi 39180

Dear Colonel Garrett:

The Mississippi Park System appreciates the opportunity of attending the public hearings on the Big Black River Comprehensive Basin Study held at Winona and Canton, Mississippi.

The Park System is interested in and has a function relative to Outdoor Recreational needs now and for the future. We are striving to obtain the latest information of the present supply, potential sites and the demands of our citizens and visitors.

We would, therefore, request that the Mississippi Park System be advised of any information the Vicksburg Corps of Engineers may obtain relative to Outdoor Recreation that may be helpful in our day-to-day and long-range planning.

If the Park System can be of service to the Corps of Engineers in this regard, please feel free to call us.

Sincerely,

Rae Sanders
Coordinator
Bureau of Outdoor Recreation

RS:wm

EXHIBIT J

FISHING • SWIMMING • BOATING • PICNICKING • VACATION CABINS • GROUP CAMPING • HIKING
TENT AND TRAILER CAMPING

EXHIBIT K

J. T. THOMAS, III, PRESIDENT
CRUGER, MISSISSIPPI

MRS. J. R. LIPSEY, SECRETARY

RAY E. JOHNSON, SERVICE AGENT
BOX 388, LEXINGTON, MISSISSIPPI

HOLMES COUNTY FARM BUREAU

P. O. BOX 388 - OFFICE PHONE 455

LEXINGTON, MISSISSIPPI 39095

May 12, 1967

Colonel Felix R. Garrett
District Engineer
U. S. Army Engineer District
Vicksburg Corps Of Engineers
P. O. Box 60
Vicksburg, Mississippi 39180

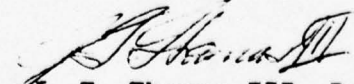
Dear Colonel Garrett

Representatives of the Holmes County Farm Bureau were present at the public hearings on the Big Black river Comprehensive Basin Study in Winona on May 2nd, 1967 and Canton on May 4th, 1967. After hearing the proposals by representatives of the Corps of Engineers, we would like to go on record favoring these proposals.

The Holmes County Farm Bureau is vitally interested in Mississippi agriculture and we believe River Basin Development can give a real boost to this phase of our economy. We feel that such a program as outlined in these public hearings would prove beneficial to all the people within this watershed.

The Holmes County Farm Bureau heartily endorses the proposals made by the Corps of Engineers, and we are ready to lend our support in carrying out this program.

Sincerely Yours,



J. T. Thomas III, President
Holmes County Farm Bureau

JTT/mjl

EXHIBIT K

EXHIBIT L

P. O. Donnell 4
Lexington, Mississippi 39095
May 12, 1967

Colonel Felix R. Garrett
District Engineer
U.S. Army Engineer District
Vicksburg Corps of Engineers
P.O. Box 60
Vicksburg, Mississippi 39180

Dear Colonel Garrett:

The Big Black Farmers Club went on record at their regular monthly meeting held at Holmes Junior College, Goodman, Mississippi, in favor of the consideration being given by the Corps of Engineers in making the Comprehensive Basin Study of the Big Black River. Several members of the Club attended the hearings in Winona and in Canton on May 2nd and May 4th respectively.

After hearing the discussions by the representatives of the different groups making this study, the Big Black Farmers Club representatives at these hearings were in favor of the basic concept of these proposals. The Club's membership in the main own property that would be affected by the different programs outlined in connection with this project. It was the unanimous feeling of the Club membership that these proposals should be completely studied and that the work necessary to effectually control the Big Black River during flood stage and to afford proper drainage and recreational facilities and other benefits should be given every consideration.

The Big Black Farmers Club wants to thank the Corps of Engineers and other participating agencies for all of the work that has been done thus far in making this study. We stand ready to be of any aid and assistance we can in completing this project.

Sincerely yours,

BIG BLACK FARMERS CLUB

By: *E. W. Hooker*

E. W. Hooker

J. B. Majure
J. B. Majure

Committee

cc: Mr. Charles U. Donald
President, Big Black Farmers Club
Goodman, Mississippi

EXHIBIT L

EXHIBIT M

P. O. BOX 288

LUTHER W. WADE FARMS
GREENWOOD, MISSISSIPPI 38930
May 6, 1967

PHONE 453-1712

COLONEL FELIX R. GARRETT
CORPS OF ENGINEERS
VICKSBURG, MISSISSIPPI

DEAR COLONEL:

I ATTENDED THE HEARING AT THE WINONA COURT HOUSE, WEDNESDAY, MAY 3, 1967 AS TO THE BIG BLACK RIVER AND IT'S TRIBUTARIES. COLONEL, I HAVE APPROXIMATELY 4800 ACRES OF LAND THAT I OWN IN THE VICINITY OF VAIDEN, MISSISSIPPI. ALL THREE FARMS THAT I OWN HAVE BOUNDARIES ALONG THE BIG BLACK RIVER. ONE OF MY FARMS ALONG HIGHWAY 51 AND 35 IS WHERE HAYES CREEK JOINS THE BIG BLACK RIVER. SOME OF THE FINEST LAND IN ALL OF THESE COUNTIES IN THIS AREA IS IN THE BIG BLACK RIVER BASIN. FROM THE FARMING AND RANCHING STANDPOINT, THE WATER DURING OVERFLOWS ARE REALLY A HAZARD. ALSO, HAYES CREEK IN WHICH ALL OF THE SEWAGE FROM THE LITTLE TOWN OF WINONA, MISSISSIPPI, IS DUMPED REALLY MAKES FOR A HEALTH HAZARD WITH ALL THE POLLUTION OF THIS WATER AND THIS IS ESPECIALLY TRUE IN TERMS OF HUMAN BEINGS AND LIVESTOCK.

AS YOU CAN TELL FROM THE ABOVE, I AM 100% FOR SOMETHING BEING DONE TO CONTROL THE FLOOD WATERS OF BIG BLACK AND IT'S TRIBUTARIES.

COLONEL, I DID NOT MAKE A STATEMENT AT THE MEETING IN WINONA AND THE REASON IS THAT IF A PERSON FROM THE DELTA PURCHASES PROPERTY IN THE HILLS SOME OF THE PEOPLE IN THAT AREA THINK THAT THEY ARE BEING INFRINGED UPON AND THEY WILL NOT DO ANYTHING TO HELP A PERSON FROM THE DELTA. SO, I THOUGHT IT WAS BEST TO GIVE YOU THIS IN WRITING.

MY FRIEND, MR. J. P. LOVE BROUGHT OUT AT THE MEETING ON MAY 3RD THAT HE WAS NOT BEING ASKED AND THAT HE WAS NOT BEING PAID ONE PENNY. HE ALSO TOLD ME THIS IN PERSON. COLONEL, I THINK THAT ANY LAND THAT IS TAKEN FROM ANY OWNER REGARDLESS OF WHO IT IS TO HELP OTHER LANDS SHOULD BE PAID FOR AT MARKET PRICE.

I HOPE THIS PROJECT WILL GO THROUGH AT AN EARLY DATE AND IF I CAN BE OF ANY HELP PLEASE DO NOT HESITATE TO CALL UPON ME. WITH ALL GOOD WISHES.

CORDIALLY YOURS,

Luther W. Wade
LUTHER W. WADE

LWW:ME
CC: MR. "MOON" MULLINS
CORPS OF ENGINEERS
GREENWOOD, MISSISSIPPI

EXHIBIT M

EXHIBIT N

May 8, 1967

Colonel Felix B. Garrett
Vicksburg, Miss.

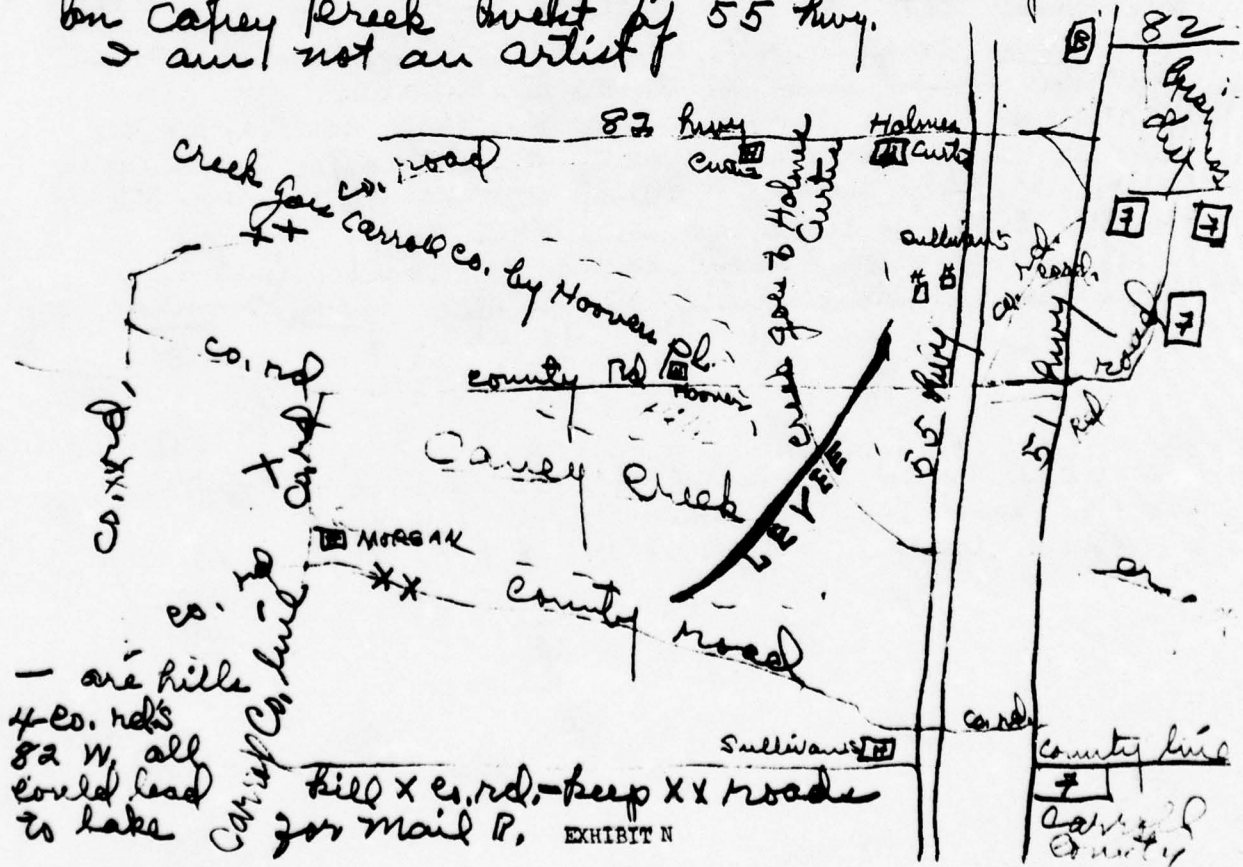
Colonel Garfield

At a lifetime resident having full knowledge of the land and water in this area, I would like to present an idea or suggestion, if I may?

Since my home town, I would say, has balanced industry with agriculture, I think we should provide recreation for our people, and by that ~~means~~ I do not mean 25 or 30 miles away, but a place they can go each afternoon in 15 minutes from each factory, and for the weekends, have a big

There is such a place (if it does include part of my son's property) - this ideal spot is on Carey Creek west of 55 Hwy. I am not an artist

I am / not an artist



Build a levee from hill to hill where
black line appears using dirt from the
pointed hill in center. ^{Shanty by post office}
You will have several hundred acres
drainage area and only 2 houses under
water - Morgan, negro woman, and Hoover, a
merchant - ^{penal property}

The V shape hill just above where dam
would be, could be used for dam, on Ben
Sullivan's property there are Spring - Spring
of water also around hills to County road
(by the way - this Co. road is $1\frac{1}{2}$ miles long & the one
west is only a 1 up the Creek) to one this is
an ideal set up for boating, fishing & etc with
so many good roads leading to it. Of course one
would dead end at Mike Sullivan
Carroll Co. traffic would come on thru Co. rd. by my
house, slip to their church, and traffic from Carroll
Co. on N. side would & west would get in on 82
or W. traffic could come this way

This may not make sense to you, but if
you knew these hills as I do you would.

Respectfully,
Sallie Sullivan

P.S. please do not misunderstand me, I think the men
did a good job of long time planning
please excuse pencil I could not draw with a pen

TRANSCRIPT OF PUBLIC HEARING

ON

BIG BLACK RIVER, MISSISSIPPI

COMPREHENSIVE BASIN STUDY

MADISON COUNTY COURTHOUSE

CANTON, MISSISSIPPI

4 MAY 1967

DEPARTMENT OF THE ARMY
VICKSBURG DISTRICT, CORPS OF ENGINEERS
VICKSBURG, MISSISSIPPI 39180

Public Hearing on

Big Black River, Mississippi
Comprehensive Basin Study

Madison County Courthouse
Canton, Mississippi
4 May 1967

The Vicksburg District Corps of Engineers held a public hearing in Canton, Miss., to discuss the comprehensive study on the Big Black River. Colonel Felix R. Garrett, District Engineer, called the hearing to order at 1930 hours.

PRESENT:

Vicksburg District, Corps of Engineers

Colonel Felix R. Garrett, District Engineer
Mr. James B. Middleton, Basin Planning Branch
Mr. James L. Graham, Jr., Special Studies Section
Mr. Richard E. Stuart, Special Studies Section
Mr. Vastine C. Ahlrich, Special Studies Section
Mr. John W. Anderson, Technical Liaison Officer
Mrs. Bertie A. Davidson, Operations Division

PRESENT ALSO:

Mr. Raymond J. Anton, Golden Eagle Ranch, Canton, Miss.
Mr. E. K. Bardin, Farmer, Flora, Miss.
Mr. Harry Barkley, Miss. Game and Fish Commission, Assistant Chief of Fisheries, Jackson, Miss.
Mr. William Hubert Britt, Soil Conservationist, Soil Conservation Service, Canton, Miss.
Mr. John T. Brown, Recreation Resource Specialist, Bureau of Outdoor Recreation, Atlanta, Ga.
Mr. Norman Brown, Parts Man, Pickens, Miss.
Mr. A. R. Burford, Assistant State Conservationist, Soil Conservation Service, Jackson, Miss.
Mr. James P. Cating, Acting Chief, Federal Water Pollution Control Administration, Vicksburg, Miss.
Mr. Bobby Courts, Implement Dealer, Pickens, Miss.
Mr. O. D. Craft, Deputy Sheriff, Edwards, Miss.
Mr. O. D. Crawford, Reporter-Photo, Madison County Herald, Canton, Miss.

Mr. C. B. Halford, Farmer, Bolton, Miss.
 Miss Claire Davis, Executive Vice President, Rivers and Harbors Association, Jackson, Miss.
 Mr. Charles Donald, Farmer, Goodman, Miss.
 Mr. James D. Goodwin, Work Unit Conservationist, Soil Conservation Service, Yazoo City, Miss.
 Mr. Harold R. Gary, Soil Conservationist, Soil Conservation Service, Vicksburg, Miss.
 Mr. F. H. Edwards, Farmer, Canton, Miss.
 Mr. W. R. Ferris, Farmer, Vicksburg, Miss.
 Mr. R. C. Flanagan, Area Conservationist, Soil Conservation Service, Jackson, Miss.
 Mr. Barry O. Freeman, Chief of Fisheries, Mississippi Game and Fish Commission, Jackson, Miss.
 Mr. J. T. Garland, Mayor, City of Pickens, Pickens, Miss.
 Mr. Tom Garrett, Farmer, Goodman, Miss.
 Mr. Bob Geoffroy, Executive Vice President, Vicksburg Chamber of Commerce, Vicksburg, Miss.
 Mr. Henry H. Hanisee, Federal Water Pollution Control Administration, Vicksburg Field Station, Vicksburg, Miss.
 Mr. A. W. Harding, Farmer, Canton, Miss.
 Mr. Everett C. Harris, Vice President, Vicksburg Terminal Elevator, Vicksburg, Miss.
 Mr. W. L. Heard, Soil Conservation Service, Jackson, Miss.
 Mr. Wyndal L. Hendricks, Work Unit Conservationist, Soil Conservation Service, Canton, Miss.
 Mr. G. B. Herring, Attorney, and President, Big Black Basin Development Association, Canton, Miss.
 Mrs. G. B. Herring, Canton, Miss.
 Mr. Robert R. Hodges, Office Manager, Madison ASCS, Canton, Miss.
 Mr. Camille Hoffpauir, Fisheries Division, Game and Fish Commission, Jackson, Miss.
 Mr. Wilburn Hooker, Legislator (House), Lexington, Miss.
 Mr. John S. Howie, Farmer, Big Black Representative, Benton, Miss.
 Mr. P. S. Hughes, Representative, Soil Conservation District, Madison, Miss.
 Mr. P. T. Hullah, Warren County Supervisor, Vicksburg, Miss.
 Mr. Ted Kendall, Farmer, Bolton, Miss.
 Mr. Kenneth D. McCall, Regional Coordinator, Southwest Region, Department of the Interior, Muskogee, Okla.
 Mr. J. L. McCaskill, Warren County Supervisor, Vicksburg, Miss.
 Mr. Alvin McCrory, Farmer (No address listed)
 Mr. L. E. McCullough, Assistant to Division Engineer, Illinois Central Railroad, Memphis, Tenn.
 Mr. J. D. McDowell, Farmer, Flora, Miss.
 Mr. Billy McMillan, Executive Director, Industrial Development Corporation, Kosciusko, Miss.
 Mr. Harold L. Martin, Work Unit Conservationist, Soil Conservation Service, Kosciusko, Miss.
 Mr. L. S. Matthews, Mayor, City of Canton, Canton, Miss.
 Mr. B. H. Maxwell, Cattle Farmer, Pickens, Miss.

Mr. Roy Newcome, Hydrologist, U. S. Geological Survey, Jackson, Miss.
 Mr. A. N. Nichols, Member Board of Supervisors, Yazoo County, Miss.
 Mr. N. H. Ostess, Manager, Madison Coop, Canton, Miss.
 Mr. Warren T. Parker, Wildlife Biologist, Bureau of Sport Fisheries and Wildlife, Vicksburg, Miss.
 Mr. E. E. Parks, Bureau of Sport Fisheries and Wildlife, Vicksburg, Miss.
 Mr. R. H. Peak, Division Engineer, Illinois Central Railroad, New Orleans, La.
 Mr. C. P. Pepper, Manager, Tri-County Coop, Pickens, Miss.
 Mr. E. O. Peterson, Chairman, Soil Conservation Commissioners, Goodman, Miss.
 Mr. B. E. Presler, Pickens, Miss.
 Mr. Paul A. Pride, Warren County Supervisor, Vicksburg, Miss.
 Mr. Earl J. Quinn, Assistant Vice President, Canton Exchange Bank, Canton, Miss.
 Mr. Rae Sanders, Bureau of Outdoor Recreation Coordinator, Mississippi Park System, Jackson, Miss.
 Mrs. Rae Sanders, Jackson, Miss.
 Mr. George D. Scruggs, Biologist, Bureau of Sport Fisheries and Wildlife, Atlanta, Ga.
 Mr. Ernest Sherrill, Meteorologist in Charge, U. S. Weather Bureau, Vicksburg, Miss.
 Mr. R. L. Smith, County Agent, Extension Service, Vicksburg, Miss.
 Mr. W. S. Smithson, Jr., Farmer, Goodman, Miss.
 Mr. Frank Stout, Farmer, Madison, Miss.
 Mr. W. R. Sullivan, County Agent, Lexington, Miss.
 Mr. Edmond I. Swensen, Forester, U. S. Forest Service, Jackson, Miss.
 Mr. George E. Townsend, Engineer-in-Charge, River Basins, Federal Power Commission, Ft. Worth, Texas
 Mr. F. C. Tyner, Farmer, Canton, Miss.
 Mr. H. R. Tyner, Farmer, Canton, Miss.
 Mr. Weldon H. Tyner, Jr., Civil Engineer, Canton, Miss.
 Mr. George S. Wade, County Extension Agent, Mississippi Extension Service, Kosciusko, Miss.
 Mr. W. J. Waits, Farmer, Pickens, Miss.
 Mr. John Wakefield, Federal Water Pollution Control Administration, Atlanta, Ga.
 Mr. M. N. Warren, Supervisor, 2nd District, Hinds County, Jackson, Miss.
 Mr. B. E. Wasson, Hydrologist, U. S. Geological Survey, Jackson, Miss.
 Mr. David Wasson, District Manager, Mississippi Valley Gas Company, Kosciusko, Miss.
 Mr. Gil Watson, Cattle and Farmer, Flora, Miss.
 Mr. R. H. Wells, Soil Conservation Service, Jackson, Miss.
 Mr. Glen Wood, Jr., Sanitary Engineer, Mississippi Air and Water Pollution Control Commission, Jackson, Miss.
 Mr. G. D. Wynne, Sr., Farmer, Pickens, Miss.

COLONEL GARRETT: Good evening, ladies and gentlemen. I am Colonel Felix Garrett, the District Engineer of the Vicksburg District, Corps of Engineers, Vicksburg, Mississippi.

For almost 2-1/2 years the Federal and State agencies concerned with water resource development have been engaged in a comprehensive study of the Big Black River Basin. Our work is now practically complete and we have arranged this public hearing in order that we may present our findings to you and obtain your comments on these findings before we prepare our final report. A coordinating committee, composed of representatives of the Governor and representatives of the Federal aid departments that were engaged in this study has served as an advisory group in guiding the investigation. I, as the District Engineer, have been a member of this coordinating committee.

I would like to introduce to you at this time the other members of the Coordinating Committee and have each of them in turn introduce the members of their staff.

The Governor's representative of this study was Mr. Sam Hailey from Canton. Mr. Hailey was unable to be here this evening. He asked that I introduce for him Miss Claire Davis from the Rivers and Harbors Association of Mississippi; glad to have you with us, Claire; and Mr. Jack Pepper, the Chief Engineer of the Board of Water Commissioners. Is he here? (No response) He hasn't arrived yet.

Next I would like to introduce Mr. Kenneth D. McCall who represents the Department of Interior.

MR. McCALL: Thank you, Colonel Garrett, and we have a number of people from the Department of Interior here.

First from the Federal Water Pollution Control Administration, Mr. John Wakefield from the Regional Office, Atlanta, and Mr. Jim Cating and Henry Hanisee from the Vicksburg Field Office, Lower Mississippi Area, and from the Bureau of Outdoor Recreation, Mr. John Brown, from the Atlanta Regional Office and from the Geological Survey, Mr. Billy Wasson and Mr. Roy Newcome of the District Office, Jackson, Mississippi, and for the Bureau of Sport Fisheries and Wildlife, Mr. George Scruggs from the Atlanta Regional Office and Mr. Gene Parks and Mr. Warren Parker from the Vicksburg River Basin Office.

COLONEL GARRETT: Thank you very much, Mr. McCall.

Mr. R. J. McConnell representing the Department of Commerce. He was unable to be here tonight. Mr. Sherrill from the Weather Bureau in Vicksburg is representing him.

Mr. Howard W. Chapman represents the Department of Health, Education and Welfare and he was unable to be here. However, Mr. John Wakefield who has already been introduced will speak both for the Federal Water Pollution Control Administration and the Department of Health, Education and Welfare. Mr. W. L. Heard represents the Department of Agriculture.

MR. HEARD: Specifically, I represent the Soil Conservation Service. I have with me several staff people.

First, R. H. Wells of the Soil Conservation Service, is the leader of our River Basin Planning Party.

Ed Swensen of the U. S. Forest Service is a member of this party.

The member from the Economic Research Service could not be here this evening.

In addition, I have two other staff members I would like to present. Mr. A. R. Burford, Assistant State Conservationist for the watersheds of the state and Mr. R. C. Flanagan, Area Conservationist, in whose area we are now meeting. I know there are several other members of the Service present who are working in cooperation with others and members of groups with whom we cooperate, but I will not take the time at this time to present them.

COLONEL GARRETT: Thank you, Mr. Heard.

Now members of the Vicksburg District staff that are here with me tonight are: Mr. J. B. Middleton, Mr. Pinkey Ahlrich, Mr. Jimmy Graham, Mr. Richard Stuart and Mr. John Anderson who saw you out at the entrance and Mrs. Bertie Davidson. Mrs. Davidson is recording this meeting tonight. We also have from the Mobile District of the Corps of Engineers Mr. Manuel Dirago, Mr. John Rushing and Mr. M. B. Oldom.

I'd like to express my appreciation to the Madison County officials for the use of these facilities tonight and specifically to Mr. Sam Hailey for making arrangements for this meeting for us.

We propose to divide this meeting into four parts: First, each member of the Coordinating Committee will describe the role of his agency in this Comprehensive Study and the results of their investigations to determine the needs in the Big Black River Basin and next we will discuss and describe the alternative projects that have been considered to meet these needs and then we will invite interested organizations and individuals to enter statements into the record as to their reactions to the plans that we present here tonight. Now these statements may be made orally or in writing, or they may be turned in after the public hearing. I would appreciate it if they are turned in after the public

hearing, that they are turned in by 20 May 1967. And finally, in the fourth and last part of the hearing, we will have a question and answer period in which the members of the Coordinating Committee and their staffs will attempt to answer any questions that you may have.

As you came through the door, you received attendance cards which had a place for your name, your organization and also a place on it for you to indicate whether you would or would not like to make a statement. Please hold up your hand if you did not receive such a card and I will have one passed to you.

Now as I indicated earlier we are here to present to you the findings of the study of the Big Black and to receive your views on these findings. This will help us to formulate a recommendation as to which of the alternatives, if any, should be recommended for construction.

We held a public hearing in Winona yesterday and we intend that the matter presented by the Coordinating Committee at the two hearings we are holding to be identical. Therefore, the only difference in the presentations will be the presentations of the local people.

Now let us take a brief look at the objective of this study of the Big Black River Basin. The primary purpose of the investigation was to determine both the present and future needs for water and related land resources within the basin and to formulate the best plan of improvement to meet these needs. A major part of our studies involved identifying these needs and listing those projects which could be constructed to satisfy them. During the course of this study, we considered the needs for water supply, waterborne navigation, flood control, outdoor recreation, fish and wildlife, pollution abatement, hydroelectric power, land stabilization measures and watershed protection and management measures.

I'd like to direct your attention to the slide here on my right. The Big Black River Basin comprises approximately 3,300 square miles. It is about 155 miles long and averages about 22 miles in width. Numerous tributaries of almost equivalent size thoroughly dissect the area, entering the main stem at fairly even intervals throughout its length.

The basin itself is agriculturally oriented and a great deal of cropland is located along the bottoms of both the main stem and the tributaries of the river. Bottom lands along the main stem comprise about one-tenth of the total drainage area. In developing a plan of improvement for the basin, our studies were not limited to the main stem or the valley section of the basin, but they extended to the drainage divide that separates the Big Black from the Yazoo Basin on the north and the west and the divide that separates it from the Pearl River Basin on the south and the east.

In the initial step of the investigation we determined both the present needs and the needs which will exist within the basin by the year 1980. These requirements were then extended 50 years into the

future until the year 2015.

As I have already pointed out, this investigation pooled the professional resources of most of the Federal and State agencies that are responsible for some phase of water resource development and I would like to now call on each agency to give you a brief synopsis of their participation in this study, and the results of their investigations to determine the basin needs. A little later on in the meeting I will ask them to present the projects which were investigated to meet these needs.

First, I would like to call on Mr. Bill Heard from the Department of Agriculture.

MR. HEARD: Thank you, Colonel. I'll give you a brief statement of the problems and needs and a little later Mr. Wells will discuss some of the projects and activities proposed. For our Department, we expect to describe the problems and needs and recommended solutions--those that we deal with in the Departmental report which will contain especially the plan that has been determined to be technically and economically feasible. Although we don't claim--we will not claim--that it has been adjusted necessarily to the views of local sponsoring organizations, which must represent local watershed groups in a program to install needed measures and structures to help solve the problems of a given watershed area. The provisions of Public Law 566, under which we carry out our watershed program, make this step mandatory.

In looking at the basin, of course, we must conclude that the basin is and will remain essentially an agricultural area. It is with this in mind that I will list some of the problems that we have encountered. (Reads Exhibit A.)

COLONEL GARRETT: Thank you very much, Mr. Heard.

I'd like to introduce Mr. George Townsend here from the Federal Power Commission. Mr. Martin from the Federal Power Commission was a member of the Coordinating Committee, and Mr. Townsend is here in his behalf.

MR. TOWNSEND: Thank you. Ladies and gentlemen. (Reads Exhibit B.)

COLONEL GARRETT: Thank you, Mr. Townsend.

Next, Mr. John Wakefield from the Federal Water Pollution Control Administration.

MR. WAKEFIELD: Thank you, Colonel Garrett.

Ladies and gentlemen, as Colonel Garrett mentioned a minute ago,

I have been asked to speak for the Health, Education and Welfare Department as represented by the Public Health Service, the action arm for this particular type of activity. They have not participated in this study for the reason that we of the Water Pollution Control Administration were at the start of the study for the Public Health Service and were asked to continue to cover water supply as well as pollution control when we split off, which was about a year ago, incidentally. The Public Health Service is interested in anything affecting the health of individuals. This would include the purity of water supply as well as a suitable quantity. The sanitary condition of recreational water where water contact sports are involved, the sanitation of shell fish, especially oysters - I realize this probably doesn't pertain to the Big Black - but it is of concern to the Public Health Service, and the vector control of diseases such as those carried by mosquitoes. We of the Federal Water Pollution Control Administration are including water supplies and the quality of water needed for recreation and shell fish in our study and the Public Health Service will have the opportunity to recommend necessary changes in reservoirs and so on in order to meet their requirements for mosquito control. This would be done in the detailed planning that will take place when a project is given further consideration. The Federal Water Pollution Control Administration is engaged in two concurrent comprehensive studies in the same area. Our own study - that is, the Water Pollution Control Administration's own study - is to develop comprehensive plans for water pollution control. These will be developed in cooperation with the State Air and Water Pollution Control Commission, and with the cities and industries involved.

At the same time, we are serving as one of the cooperating agencies of those that have been listed here tonight in this coordinated study of water and related land resources that we are speaking of tonight. As such, we have determined the water supply and water pollution control needs of the basin and how these needs might be satisfied by proposed Federal undertaking. The two undertakings are completely compatible and will both use the same field data. Our study of the Big Black Basin has been considerably aided by the assistance and cooperation of the members of the Big Black River Basin Development Association who at our request served as our Water Use Committee and also by advice that we have received from the State Water Pollution Advisory Committee chairmanned by the State Health Office. These gentlemen have served as ex-officio members of our Water Use Committee as I have mentioned. Through them we have learned of the needs and desires of the people of the basin. We were informed by our committee that the basin needs industrial growth but that the citizens desire to regulate industrial development so that the main stem of the Big Black can be used for Fish and Wildlife habitat and for recreation and for agricultural water supply. We find that these goals with one or two possible exceptions can be achieved without any requirement for low flow augmentation on the main stem.

This is assuming that conventional treatment of sewerage and industrial waste will be provided by the cities and industries that are involved. This does not contemplate, however, that there would be sufficient water for a major wet industry in the upper portion of the basin. Our economic studies failed to justify a consideration of that type of industry in that area. Now, there is water in the lower part of the basin that will take care of a considerable industry and the water in the entire basin is adequate for the projected population growth and employment growth as shown by the projections of past history. This amounts to something more than double the population growth in 50 years and to more than 50 percent growth of employment. So there is considerable margin for growth, although as I say, there is insufficient water in the upper portion of the basin to serve the needs of a major water industry and still have water that would meet these other desires as expressed by the Water Use Committee. The exceptions that have been noted are two. First, that we find rather high concentration of bacteria normally associated with sewerage in portions of the basin that do not have known sources of sewerage. Now these result, we think, from the concentration of cattle which have the same organisms and chickens in this basin which may give us problems in using these waters for recreational purposes.

The other problem that we note is that the tributary streams are rather small in flow and there are some sizeable towns including Canton located in the extremely upper portions of those tributary streams. Now, these streams go dry in dry weather and at such times as this they do not provide the dilution that would be necessary if these streams are to be used to receive treated waste, which you have to do, and at the same time maintain them for fish and wildlife purposes. So if these streams are to be used for other purposes besides receiving treated waste, it will be necessary to find dilution from some source and the small watershed projects that Mr. Heard has spoken of would provide a possible source of this water, except that the Department of Agriculture has not been authorized to include low flow augmentation as a benefit for those small watershed projects. So if this is to be done, before Congress approves the use of that benefit for the small watershed projects, it will be necessary for the local non-Federal agencies to pay for this storage in the small watershed projects.

COLONEL GARRETT: Thank you, Mr. Wakefield.

Next, Mr. John Brown, representing the Bureau of Outdoor Recreation.

MR. BROWN: (Reads Exhibit C, pages 1 - 3)

COLONEL GARRETT: Thank you, Mr. Brown.

Mr. Billy Wasson, representing the U. S. Geological Survey.

MR. WASSON: Congress has charged the U. S. Geological Survey with the responsibility for the appraisal of available water in river basins and in areas where projects cross in basin lands. This includes mapping aquifer frame work, determining the chemical and physical quality of the water resources, the interrelation of surface and ground water and the water requirements for industrial, domestic and agricultural needs and providing scientific and technical assistance in the hydrologic field to other Federal agencies.

Now, I would like to give you a short summary of the water availability report made by the U. S. Geological Survey in the Big Black River Basin Study.

Our study in the Big Black River Basin has shown that abundant supplies of good water are available from either surface water or ground water sources. For 90 percent of the time flow of water in the Big Black River below Pickens is greater than 85 cubic feet per second and the minimum flows are greater than 5 cubic feet per second in five of the eastern tributary streams in the upper half of the basin. Quality of surface water is excellent, except for minor organic pollution from municipal waste and from brine solution from several oil fields in the lower part of the basin. Most of the available ground water is contained in six geologic units; the beds of Cretaceous age, and the Wilcox, Meridian, Sparta, Cockfield and Catahoula formations. The aquifers dip generally towards the southwest and they overlap to the extent that a well drilled to the base of fresh water will in most places penetrate two or more aquifers. Well depths range from 10 to 2400 feet. In several areas fresh water extends deeper than 2500 feet, but near the mouth of the Big Black River, brackish water is encountered only 300 feet below the ground surface. Practically all water presently pumped for man's use in the basin is from the ground. This amounts to about 11 million gallons per day. However, additionally a small amount of surface water is used for supplemental irrigation of row crops. Wells producing 500 to 1000 gallons per minute are common in the basin. Most of the area is underlain by one or more aquifers from which a properly constructed well could produce as much as 2000 gallons per minute. Well fields in each of these aquifers may produce more than 10 million gallons per day. Base flow of the streams which is ground water overflow or discharge will not be significantly affected by heavy pumping from the artesian aquifers. However, heavy pumping from the shallow aquifers to provide irrigation supplies could significantly reduce the base flow of some streams.

Thank you.

COLONEL GARRETT: Thank you, Mr. Wasson.

Mr. Gene Parks representing the Bureau of Sport Fisheries and Wildlife.

MR. PARKS: This statement represents the summary of our Bureau's agency report on fish and wildlife resources of the basin. (Reads Exhibit D, Part 1.)

COLONEL GARRETT: Thank you, Mr. Parks.

Now I will briefly summarize the participation by the Corps of Engineers. Initially, we determined the needs within the basin for flood control and navigation improvements and then we compiled these needs, and those as determined by each of the other participating agencies and investigated projects which would be designed to satisfy them.

We found that floods occur within the Big Black River Basin rather frequently and damages are prevalent throughout the entire basin. Bottom lands along the main stem of the river incur approximately two damaging floods a year during the crop growing season and under existing conditions, some 45,000 acres are inundated annually with an average annual flood damage of approximately \$240,000. Agricultural damage, most of which is to crops, constitutes about 90 percent of these losses. The principal highways and railroads are above flood level and the timber industry incurs only minor flood losses on the main stem.

As far as navigation is concerned, presently we found there is no need for a navigable waterway within the Big Black Basin proper. However, with the trade activity and the industrial development in the Jackson area, there is a need for water transportation into Jackson and if the present industrial growth in this area continues, the demand for water transportation may increase in the future to the point that a navigation canal linking the Jackson area with the Mississippi River could be economically justified.

Now, that briefly covers the Corps' participation in developing the needs of the basin. Now let us take a look at some of the projects which were considered in formulating a plan of development for the Basin itself.

First, I'd like to call on Mr. Ray Wells to discuss the projects which the Department of Agriculture studied.

MR. WELLS: Thank you, Colonel. Mr. Ed Swensen with the River Basin staff in Jackson will make several references to the map as I present some of the results and findings of the Department of Agriculture's study in the Big Black Basin. Within the Big Black Basin, we have identified 37 upstream watersheds. (Reads Exhibit E, Sections III, IV, and V.)

COLONEL GARRETT: Thank you, Mr. Wells.

I'd like to call on Mr. Jimmy Graham now from my office to discuss the plans of improvements that were considered by the Corps.

MR. GRAHAM: As was pointed out earlier, analysis of the basin's water and related land resource needs indicated deficiencies in satisfying both the immediate and long-range needs for flood control, power and recreation, with a need for navigation into the Jackson area developing in the future. Projects which we have considered were separated into two categories: (1) those projects needed by the year 2020, and (2) those projects needed by the year 1980.

We considered 4 types of improvements: (1) major impoundments; (2) improvement of stream channels; (3) construction of levees; and (4) development of recreation facilities.

Briefly, I will describe each of the plans which we have considered.

As you can see on this slide (indicating), we studied two reservoirs on the main stem of the Big Black River. One was in the vicinity of Durant, Mississippi, and the other was just north of Edwards.

Our next plan, as you can see here (indicating) on this plan, consisted of a series of loop levees along the main stem of the Big Black. These are small levees which would tie into the hill line and protect localized areas of 1,000 to 2,000 acres.

We next considered providing for flood protection by channel improvement and enlargement. The first channel enlargement plan would have contained the 3-year May to October frequency floods within banks. The second plan which we considered was to clear and snag the existing river.

Each of these channel improvement plans was also studied in connection with the Soil Conservation Service's plan which Mr. Wells described. Each of these green dots represent the flood water retarding structures of the SCS.

We next looked at a system of 17 reservoirs which would be located on streams tributary to the Big Black River. By itself, no one reservoir would control enough of the drainage area to provide any flood protection. However, as a total unit these 17 reservoirs would control approximately 28 percent of the total drainage area of the basin. This would provide some flood protection to the bottom lands along the main stem of the river. You might note that while these reservoirs are providing some flood protection along the main stem, they are taking out

of production some of the most fertile agricultural lands within the basin. That is these lands lying along the tributary bottoms.

These reservoirs (indicating) were also studied in connection with the Soil Conservation Service's plan. As you can see on this slide, those SCS structures which are located upstream from the reservoirs were eliminated. For example, on Seneatcha Creek, you might note that there are now no SCS structures; whereas on a previous slide, the SCS plan of development provided 11 structures in this watershed. These structures were eliminated because the reservoir would inundate the tributary lands which the 11 SCS structures are designed to protect.

Finally, we investigated the possibility of providing a navigable waterway linking Jackson to the Mississippi River. This slide shows 4 possible routes for such a canal. All of these routes would require a system of several locks and dams and partial diversion of flows from the Pearl River to maintain flows in the canal. Preliminary studies indicate that, at the present time, the cost of either of these plans would be considerably more than the transportation savings which would be realized.

Briefly, this covers the plans which the Corps of Engineers has investigated.

Of all the plans which we have considered, the only plan which could be economically justified is the tributary reservoir plan. These reservoirs were investigated as multipurpose projects combining flood control and recreation as project purposes. However, the flood control part was not found to be economically justified and could not be included as a project purpose.

These reservoirs, then, would be serving purely a recreational purpose. I might point out that under existing laws, the Corps of Engineers cannot construct a single purpose recreational project. However, there are programs under which the Federal Government will share in the cost of a single-purpose recreational project.

These reservoirs would take out of production some of the most fertile agricultural lands within the basin, and it does not appear that they would meet the overall needs of the basin. We, therefore, are not recommending these reservoirs for construction at the present time. However, these reservoirs, or an alternate to them, should be considered in the future, as the basin develops, as a means for meeting these needs.

COLONEL GARRETT: Thank you, Jimmy.

I'd like to ask Mr. John Brown to discuss the projects which the Bureau of Outdoor Recreation has studied.

MR. BROWN: (Reads Exhibit C, pages 4 and 5.)

COLONEL GARRETT: Now Mr. Gene Parks will discuss the projects that the Bureau of Sport Fisheries and Wildlife considered.

MR. PARKS: Thank you, Colonel. (Reads Exhibit D, Part 2.)

COLONEL GARRETT: Thank you, Mr. Parks.

Now, that completes the presentations of the findings of this group. At this time I would like to receive statements anyone would like to make at this hearing for the record. As I indicated earlier, these statements can be made in writing or they can be made orally, but if you have a statement that you would like to enter into the record at a later date, I would ask that you submit it to us, again, before the 20th of May 1967. Now I recognize that this is a very early date; however we have to have the record complete so that we can finalize this report.

First of all, I would like to call on those people who have indicated on their registration card that they would like to make a statement tonight.

First, we have a Mr. Raymond J. Anton from the Golden Eagle Ranch. Mr. Anton.

MR. ANTON: I feel like a feist dog barking at a big bear. I believe would be the way to put it. I think really that there are only about four ways that you gentlemen can justify these many expenses you're talking about. You're talking about \$48,000,000 like I talk about \$48.00, but it would seem that you have just about four ways, I would say floods and agricultural value, industrial use and recreation. Now as for floods, those pictures I saw up there are the damndest flood I ever saw on the Big Black. Particularly those 17 dams. It doesn't affect me, my farm's not on the area of the 17 dams, but that's some good land that will be taken out of production. It looks like we're covering the middle of the county with concrete and houses and then we put the Pearl River on one side and flooding it that way and now we're going to put reservoirs all through the middle and on the other side and cover it up that way. Agriculturally, I'm afraid we'll be taking away a lot more than we will be adding. On the recreation that falls in with agriculture, the man tells us from the Board of Health that all we have to do is sell our cows and chickens and the water will be suitable to use. Some of these guys around here that fish, you ought to see them fish. Then we had industrial use. I've got one little ole peckerwood sawmill and I know of one more on the Big Black. There's just not much industry on the Big Black. It is very flat and when it floods, it floods shallow, but over a long basin and it doesn't hurt the timber much. It seems that it gets off and doesn't seem to bother things too much and it just seems to me that no matter how you start

justifying it and on recreation--one thing I didn't mention too on there, we have the Pearl River reservoir here. We've got the Grenada Dam; we've got Enid, Sardis and Arkabutla, all these within two hours drive and then we have the Big Black as it is--it provides some recreation. We have the Mississippi River, Eagle Lake, many, many private lakes, etc. And it just seems to me we're getting a little enthusiastic just for recreation purposes and forgetting about the fact that one day we're going to be awfully sorry if we cover up too much land and we'll be wishing we had some place to plant a potato patch to make our living and in this area, as you stated, it's an agriculture area and we make our living from farming and we'll probably do that a long, long while. That's all I have to say, sir.

COLONEL GARRETT: Thank you, Mr. Anton.

Miss Claire Davis from the Rivers and Harbor Association has indicated she would like to make a statement. Claire.

MISS DAVIS: I'd like to make some general comments later on, if I might, Colonel, particularly with reference to what has just been said. I think that they need to be said. Right now I would like to say the same thing that I said in Winona. Of course, we will mail in an official statement after we've gone over all the comments that have been made here. We appreciate all the work that all the people on the committee have done and we look forward to working with the people in the local area, particularly as far as my association is concerned, in the future, because now they have what they need to work with.

COLONEL GARRETT: Thank you, Claire.

Mr. G. B. Herring, who is President of the Big Black River Development Association.

MR. HERRING: Colonel Garrett and you gentlemen associates on this report, about the only thing I had in mind to say when I put my name on the card was, "Thank you." Six years ago we started efforts to get this river basin studied and we have, and as far as I am concerned it is very, very enlightening. I can mention, of course, the industrial possibilities down in all through this area and down to Vicksburg and the city of Jackson, and the channel clearing project possibilities, the small watersheds, the fish and wildlife and many other things which you men have worked over very carefully and thoroughly. There is developing a pollution situation down here near Flora. It has been called to the attention of Mr. Wakefield. I believe one of you mentioned it. We did have some reaction about the need of shipping from Yazoo City and for plants here. I noticed you had your canals and it's all in there. And the thing that I would like for everyone here to understand is that what we have now that we didn't have is the result of a study

by all of you men and women who are experts in this field that, as I understand it, will be available to the citizens and the Chambers of Commerce throughout the area. May I inquire, Colonel Garrett, when will the report be available for general use?

COLONEL GARRETT: Of course, each agency will prepare their own reports and then submit comments to the Corps for a summary report. The summary report will be the report of the Coordinating Committee, and we are planning now to have that report in final form some time around October, and then, of course, it will be forwarded up through channels and it will be available shortly thereafter.

MR. HERRING: Again, I want to thank you. This is a culmination of a lot of hard work in trying to get this study completed and again I want to thank you and we are glad to have you here in Canton with us.

COLONEL GARRETT: Thank you, Mr. Herring.

Those are all the people that indicated on their registration card that they wanted to make a statement. Would anybody else present like to make a statement at this time?

MR. GARLAND: What I have to say is more of an announcement of general interest and may enter the point as to whether or not it is the truth. You know we had a papermill in Pickens for some four or five years now and it's been closed down for about six months. I was called Tuesday afternoon by a man from Washington, some of you may know him, Mr. Dunn, with the Department of Commerce. The papermill has been sold to Burroughs Paper Company of Little Falls, New York. At least the contract for sale has been signed. The deed has not been signed. I haven't been able to talk to Mr. Burroughs. Mr. Dunn told me that they were going to expand the plant. Whether or not they have any idea of going into pulp making in the future, I don't know. But I do feel like they would be interested in any development of the river. And as soon as Mr. Burroughs gets down I would like to acquaint him with what has been done. I just make that announcement because some of you, I know, are stockholders in the mill and you can forget it.

COLONEL GARRETT: Thank you, sir. Are there any other statements?

MR. WATSON: Colonel Garrett, as you mentioned, you wanted all this in by May 20th. Ray and I don't know each other, but we have a lot of good mutual friends and he and I disagree heartily and I think friendly, and I would propose that he enter that into the record formally, if you don't have it all down and I personally, with another group from Madison, would like to counter it and we'll have it in your files by May 20th.

COLONEL GARRETT: Are there any other statements at this time? Then,

I'd like to open the meeting to a question and answer period. Does anybody have any questions they'd like to ask the Coordinating Committee?

MISS DAVIS: I mentioned that I wanted to make this in Winona the other day and I think this is a good place to make it too. For some reason and I'm not sure why--maybe this will bring forth some questions and some answers from the local people that are involved. In all of our work with the project throughout the five years I've been working with it--for some reason there has been a great deal of confusion as to the effect, once the study is made, what do we do then? Everybody seems to set back and get the idea they're going to present this big study to us then tell us exactly what needs to be done and what has to be done, and then, by George, we're going to have to do it. Without the understanding, though it's been said time after time, that the local people only will be responsible for whatever projects are accepted. Now, I'm not fussing and I'm not criticizing, because of my position I can't afford to. I've got one of my directors sitting here and of course he would tell the others and that would be the end of that. But I think it's time we all took a long look at what we're trying to do here. Now we have a good report. The facts have been given to us of what can be done in the district. They've told you what you need in the district and they've told you how you can get what you need to provide for those areas that are lacking. Now it's not a matter that they're going to come in here and build these projects on your land whether it's for recreation, whether it's these 17 reservoirs that have been mentioned. These aren't going to be done unless the local people want them and desire them.

Now, another area that's needed. We always talk about coordination. I'm up to the hilt in it myself. There's also been a deep confusion and misunderstanding for some reason--again, I don't know why and others don't seem to know, of the difference between the report of the committee and the Big Black District as it will be formed and set up under legislature. Now, there's always been some confusion that the district, and for some reason the report, are the same, which is impossible. Now to kind of half way try to clear this, it's just a two-way proposition. No. one, the men have done a study for you, the local people, and I'll include myself in that because I reside within the area out of Hinds County. That's the beginning, and the rest is up to you and if you don't want it, all you have to do is take this report and throw it in the wastepaper basket. That's up to you. If you don't want the recreation facilities, that's fine. If you don't want the flood control facilities, that's fine too, but it's up to you as the local people. Now, it's just a matter now of you getting together as a group, as a whole basin, not as one little small watershed, not as one county. There is an entire 11-county district, deciding as a local people what you want and what you want to do with it and then going after it. You

have the means to do it with and I don't think we, as any group, have the right to say that a project as presented here or any other place is not right. All that's been told you is what's needed and what can be done feasibly to take care of those needs. Now it's up to you as a local people to get the job done.

COLONEL GARRETT: Thank you, Claire.

Any questions?

Well, ladies and gentlemen, I want to tell you we certainly appreciate your interest and the courtesy that you've shown us here tonight. I think we've had a good meeting and I want to thank you most sincerely for your hospitality. Thank you.

EXHIBIT A

BIG BLACK RIVER BASIN
PUBLIC HEARING

Winona and Canton, Mississippi
May 3 and 4, 1967

WATER AND RELATED LAND RESOURCE PROBLEMS AND NEEDS
AS IDENTIFIED WITH UPSTREAM WATERSHEDS

The problems of the land are many and real. The solution to many problems can be achieved through local, State and Federal cooperation. Solving some problems will depend upon local initiative and resources.

Erosion

Erosion, while still a serious problem, is less intensive now than in the past. Sheet erosion is moderately to severely active on over 300,000 acres of cropland and over 500,000 acres of pastures. The land in forest poses a lesser problem. There are about 20,000 acres of forest land and over 59,000 acres of open land that need critical area stabilization. Erosion is moderate to severe on about 1200 miles of roadbanks.

Floodwater

There are over 275,000 acres of land subject to overflow in upland watersheds. The total direct annual damages from flooding is \$2,300,000. Of this amount about \$2,000,000 is damages to crops and pastures, over \$127,000 damages to minor fixed improvements on farms and over \$218,000 are damages to public roads and bridges. Damages to urban and industrial areas are relatively insignificant.

All or parts of 32 watersheds in the Basin have land and water problems that naturally affect the use, management and production of crops and pastures. Five watersheds in the lower part of the Basin are affected to a lesser extent. Within the 32 watersheds over 258,000 acres of floodplain lands are inundated on an average of three to four times during the growing season.

Sediment

Deposition of sediment is a relatively minor problem throughout the Basin as a whole. It does, however, contribute to flooding by filling stream channels, thereby causing added damages to crops, pastures and fixed improvements. A great amount of sediment enters the stream system from extensive gullied areas or from eroding roadbanks.

Impaired Drainage

Most of the channels in the upland watersheds have sufficient capacity to carry runoff from normal precipitation. In many instances, however, complete water disposal systems have not been constructed because of the frequency of flooding in bottom lands. Over 435,000 acres of land in the Big Black Basin have a drainage problem. Of this amount, 248,000 acres are open land in crops and pastures and the remaining 187,000 acres are in forests. The estimated average annual reduction in net income from inadequate drainage of open land is about \$1,800,000.

Flood Control and Prevention Needs

Studies made in upland watersheds indicate an immediate need for flood prevention measures. The first need is for land treatment measures to be applied on those lands where erosion is a problem. Structural measures needed in conjunction with land treatment measures to further reduce flood damages include 186 floodwater retarding structures, 17 multiple-purpose structures, and 937 miles of channel improvement in the 32 feasible upland watersheds.

Irrigation

The average rainfall for the Study Area is approximately 50 inches. However, lack of sufficient soil water during the growing season reduces yields and often causes crop failure. The immediate problem in the Basin is not sufficient gross annual rainfall, but inadequate frequency and distribution of rainfall during the growing season. The need for project-type irrigation measures was not considered to be feasible in the Basin at this time; however, irrigation may be profitable to individual farmers and specialized crops.

Other Problems and Needs

Water for rural domestic household and livestock uses is not a problem insofar as supply is concerned. Adequate ground water is available from wells, springs and streams in all parts of the Basin.

The Department of Agriculture River Basin report will identify problems and needs relating to fish and wildlife, recreation, and pollution.

However, participating agencies with responsibilities in these fields will make reports at these hearings.

AD-A036 820

BIG BLACK RIVER BASIN COORDINATING COMMITTEE VICKSBURG--ETC F/G 8/6
BIG BLACK RIVER, MISSISSIPPI COMPREHENSIVE BASIN STUDY. VOLUME --ETC(U)
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EXHIBIT B

Role of the Federal Power Commission and Findings on Needs for Hydroelectric Power in the Big Black River Basin

Introduction

The Fort Worth Regional Office of the Federal Power Commission has developed the hydroelectric power needs of the Big Black River Basin and has cooperated with the Vicksburg District of the Corps of Engineers in its screening studies of the potential hydroelectric projects. The need-resumé I will present is based on our report furnished on March 28, 1967 to the District Engineer, Vicksburg District. The data presented will show (1) hydroelectric needs in 1980, and (2) needs in the years 2000 and 2020. Also to be described will be items considered in the derivation of the hydroelectric power needs.

Needs in 1980

We have developed data showing the need for 4,260 mw of hydroelectric power in 1980 in FPC's Study Area K. I will tell you about the Study Area K in just a moment. Of this amount, 2,670 mw could be in pumped-storage hydroelectric capacity and would include 1,520 mw proposed or now under construction in Area K. This indicates that additional pumped-storage capacity would be needed in 1980 in the amount of 1,150 mw. Conventional hydro capacity in 1980 is needed in the amount of 1,590 mw. If it were economical to do so, some of the above noted capacity could be installed in the Big Black River Basin and included in the comprehensive basin plan for the next 10 to 15 year period.

Presented on May 3 and 4, 1967 by George E. Townsend, Engineer-in-Charge,
River Basins, Fort Worth Regional Office, Federal Power Commission

Needs in 2000 and 2020

The next important conclusion developed concerns the long range possibilities for hydroelectric installations. Potential hydro capacity which could be supplied in Area K in the year 2000 is 14,260 mw, and in the year 2020 is 29,660 mw. Of these amounts 6,920 mw in the year 2000 and 13,540 mw in the year 2020 could be in pumped-storage hydroelectric capacity (including the 1,520 mw proposed and now under construction). From what we know of the potential conventional power sites in the Big Black River Basin and the rest of Area K, even if they were all economically and financially feasible to construct, they are not enough to meet the projected demand. In the Basin, conventional sites are sparse, and pumped-storage sites are non-existent.

Background

Aside from the projected needs, you should know something of the criteria and background on the derivation of results.

The Market Area

Federal Power Commission Coordination Study Area K, which comprises essentially the area served by the Southwest Power Pool and associated systems, has been designated as the power market area for hydroelectric power from Big Black River Basin projects. Area K includes all of the States of Arkansas and Louisiana and parts of the States of Kansas, Oklahoma, Missouri, Texas, and Mississippi. Consideration is given to inter-regional transfers with the Tennessee Valley Authority on the eastern side and the Department of the Interior on the northern side of Area K.

Past and Estimated Future Power Requirements

The peak demand in Study Area K is expected to grow from 13,070 mw in 1965 to 35,900 mw in 1980 as documented in the National Power Survey. This estimate has been extended to the year 2020 for this study at which time the peak is expected to reach 182,000 mw.

Power Supply

Both Study Area K and the Big Black River Basin are served by utilities representing all segments of the industry. The entire area is blanketed by transmission lines ranging from 69-kv to the 500-kv transmission now in service. In Study Area K, the installed capacity as of December 31, 1965 was 16,172 mw which was required to meet the peak demand of 13,070 mw as noted above. A seasonal diversity interarea transfer reaching 2,500 mw before 1980 with the Tennessee Valley Authority is used in power supply analyses. The future power supply will include a number of large steam-electric generating units, several of which currently are in the 500 mw size.

Need for Additional Capacity

An analysis of the existing and expected future power supply in Study Area K indicates that there was a surplus above reserves of 1,534 mw in 1965, and an indicated need for 12,783 mw of additional capacity by 1980. Of this required additional capacity, a portion could be met by hydroelectric capacity.

Existing Hydroelectric Resources

In Study Area K, there are 29 existing hydroelectric projects with

an installed capacity of 3,237.4 mw, including projects under construction and definitely scheduled. None of these are in the Big Black River Basin.

Potential Hydroelectric Resources

Hydroelectric projects have several important advantages over thermal plants in that they do not consume water or fossil fuels, do not contribute to thermal pollution of water or air, have low operation and maintenance costs, can start quickly and meet load changes readily, and provide other corollary benefits. There is a growing need for peaking capacity throughout Study Area K which may be met by projects at potential sites. There are few sites, if any, at which an economical single-purpose conventional hydroelectric project can be constructed. Hydroelectric power, both conventional and pumped-storage, however, can be developed as a function of a multiple-purpose project in comprehensive basin developments.

Portion of Future Load Which Could be Supplied by Potential Hydroelectric Projects

Monthly load duration curves for 1980, 2000, and 2020 have been developed for Area K which demonstrate the utilization of existing and under-construction hydroelectric projects and the maximum hydroelectric capacity that can be utilized in the peak load month, usually in August.

Summary

Summarizing, by 1980 the load shape is expected to be able to

accommodate potential new hydroelectric capacity amounting to 4,260 mw of which 2,670 mw could be pumped-storage hydroelectric capacity. This 2,670 mw includes a total of 1,520 mw for projects proposed or now under construction and leaves 1,150 mw of new pumped-storage capacity for development by 1980. Similarly, for the year 2000, the load would accommodate new hydroelectric capacity totaling 14,260 mw of which 5,400 mw could be new pumped-storage capacity. For the year 2020, corresponding figures would be 29,660 mw and 12,020 mw. The amount of needed capacity is greater than the amount of conventional capacity available at the potential sites. This concludes the summary of overall power needs in the Big Black River Basin.

EXHIBIT C

Statement By
Bureau of Outdoor Recreation at
Public Hearings at Winona, Mississippi, May 3, 1967
and Canton, Mississippi, May 4, 1967

Agency Role and Findings

The Bureau of Outdoor Recreation, through its Southeast Regional Office in Atlanta, began its participation in the Big Black Comprehensive River Basin Study in July 1964.

The role of the Bureau in this study was to investigate and evaluate the existing and potential outdoor recreation resources within the Big Black River Basin study area, which presently, or may in the future, provide outdoor recreation opportunities. The Bureau also assisted in the evaluation and formulation of the recreation aspects of water and related land resource development projects considered for construction in both early-action (1980) and long-range (2015) action programs.

Our recreation study of the area included an inventory of existing public outdoor recreation areas and an identification and evaluation of potential resources and developments which may provide recreation opportunities in the future. Consideration was given to the active recreation use of developed resources as well as to the preservation, protection, and potential development of the basin's undeveloped resources.

The study evaluated the present types of recreation activities and the extent of participation in these activities. It also projected

future outdoor recreation demand by selected activities and groups of related activities. Needs for land and water areas and facilities to accommodate the projected demands were estimated.

The Bureau's findings in the study are grouped into Demand, Supply, and Needs. Recreation demand is defined as a measurement of the amount and kinds of outdoor recreation facilities and activities the public desires. Supply is an appraisal of the capacity of the existing areas and facilities to meet the demand. Needs are the amount of resources and facilities necessary to meet the unsatisfied demand.

Demand for the activities of swimming, boating, camping, picnicking, canoeing, and other activities was calculated for 1965, 1980, and 2015. The total annual recreation demand was estimated at nearly 7 million recreation days in 1965, almost 11 million recreation days in 1980, and over 35 million recreation days in 2015. The demand for recreation is greatest in the southern one-half of the basin, as this is the area of greatest present population and projected population growth. This area is also influenced by the Jackson Standard Metropolitan Statistical Area.

The public and private supply, as of 1965, of existing recreation resources and facilities in the study area was also determined. The public supply was projected to 1970 by considering presently programmed additions to public recreation facilities. No method was available to project the private supply.

In 1965, facilities existed in the basin study area that were capable of accommodating about 570,000 recreation days of use annually for the four major activities of swimming, boating, camping, and picnicking. For 1970, the supply is expected to increase to a point that will accommodate about 670,000 recreation days use for these four major activities.

Needs for outdoor recreation resources and facilities were determined by comparing the existing and projected supply of recreation facilities with the existing and projected demand for such facilities. A need for additional boating water and camping, picnicking, and swimming facilities exists for 1965, and this need becomes much greater in the target years of 1980 and 2015.

In 1965, a need for facilities to accommodate over 1 million recreation days of use for the activities of swimming, boating, camping, and picnicking existed. In 1980, the unsatisfied demand is projected to be in excess of 2 million recreation days annually, and in 2015, over 9 million recreation days annually for the activities dependent on or enhanced by water.

Projects Considered

To meet this need for recreation resources and facilities, which I discussed in the earlier portion of this meeting, various alternatives were considered. They included the expansion of existing recreation areas, improved access to existing resources, and development of new recreation areas.

For the early-action period (1980), much of the need for recreation can be met by expanding two existing recreation areas, the Holmes County State Park and the Choctaw Recreation Area, and by the construction of 17 multi-purpose reservoirs by the Soil Conservation Service. Facilities for swimming, boating, camping, and picnicking can be provided at these areas. Since facilities for boating are the greatest need in the basin, some of these proposed reservoirs will be designed to give boating prime consideration.

In the long-range period (2015), some of the projected annual recreation needs can be met by the expansion of facilities at the early-action projects. These would be the Soil Conservation Service multi-purpose reservoirs, Holmes County State Park, and the Choctaw Recreation Area. In addition, other recreation areas will be needed, particularly those to accommodate the activities of boating and swimming. The six multi-purpose reservoirs in the considered long-range program of the SCS would accommodate many recreation activities with the development of facilities. However, in addition to this, about 13,000 acres of

water would be desirable to provide more opportunities for swimming, boating, camping, and picnicking.

In considering a recreation plan for the Big Black River Basin, the recreation opportunities to be provided by a project in the adjacent Yazoo River Basin have been included. This project would provide a 3,000 acre navigation pool with adjacent recreation facilities. It would also result in a modification of the operation of Sardis, Enid, and Grenada Reservoirs that would enhance the recreation aspects of these areas and result in their providing additional recreation opportunities for the people of the Big Black River Basin.

The Natchez Trace Parkway, part of which falls in the study area, presently provides and will continue to provide recreation opportunities for residents of the basin. The present facilities and the long-range plans for the Parkway have been considered in this recreation study.

It would not have been possible to carry out the Bureau's responsibilities of this comprehensive study without the cooperation of State, Federal, and local agencies and officials. The Bureau expresses its appreciation to these people for their excellent cooperation.



EXHIBIT D

**UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
PEACHTREE-SEVENTH BUILDING
ATLANTA, GEORGIA 30323**

April 28, 1967

District Engineer
U. S. Army, Corps of Engineers
P. O. Box 60
Vicksburg, Mississippi 39180

Dear Sir:

(Part 1)

Reference is made to your notice of public hearings, dated April 3, 1967, relative to the presentation of the results of the Big Black River Comprehensive Basin Study for the purpose of soliciting the views of all concerned prior to final formulation of the plan of development for the basin.

We appreciate the opportunity to participate in these hearings, and our agency representative will make this statement in behalf of the Bureau of Sport Fisheries and Wildlife. This statement represents a summary of our agency report on fish and wildlife resources of the basin.

The Bureau's participation in the Big Black River Comprehensive Basin Study is authorized under the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). Our study has been conducted with the cooperation and assistance of the Bureau of Commercial Fisheries and the Mississippi Game and Fish Commission.

The Bureau of Sport Fisheries and Wildlife made a determination of the present and anticipated future demand for sport fishing and hunting, based on current and projected population estimates for the Big Black Basin study area. Demand methodology was derived from data extracted from the 1960 National Survey of Fishing and Hunting. Demand for commercial fishery resources produced in the basin was provided by the Bureau of Commercial Fisheries.

The existing and future water and land resources of the basin were inventoried, classified by fish and wildlife habitat type and evaluated in terms of potential resource supply to provide fishing and hunting opportunities.

EXHIBIT D

Based on population projections and per capita participation rates, fishing demand is expected to increase from 606,000 man-days in 1965 to 614,000 by 1980 and 873,000 man-days by 2015. Hunting demand will change from 358,000 in 1965 to 353,000 by 1980 and 464,000 man-days by 2015.

Future fishing and hunting needs represent the difference between resource supply and the demand for opportunities. Determination of the needs or unsatisfied demand provided a base for fish and wildlife planning goals.

The results of our study indicate that sport fishing demand by 1980 within the broad confines of the basin study area can be satisfied by the existing resource supply. However, better distribution of fishery habitat would enhance opportunities in localized sections of the basin. Approximately 35,000 man-days of fishing opportunity will be needed by 2015 in the northern subarea of the basin.

Primarily because of restrictions on use and a low-level of wildlife management on private lands, approximately 14,000 man-days of hunting needs are indicated at the present time in the southern subarea of the basin. Hunting needs will increase to 18,000 man-days by 1980 and 122,000 man-days by 2015.

The annual harvest of commercial fish in 1960 from natural waters was estimated to be 200,000 pounds. Additional requirements are estimated to be 83,000 pounds by 1980 and 201,000 pounds annually by 2015.

(Part 2)

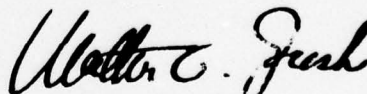
Proposed project development plans proposed by the Soil Conservation Service will materially increase sport fishing opportunities throughout the basin study area and adequately satisfy local fishing needs by 1980 and 2015. The projects will provide 55,000 man-days of fishing by 1980 and 77,000 man-days by 2015. Flood control and drainage project proposals will result in hunting losses caused by inundation of wildlife habitat and the anticipated clearing of woodland habitat in the flood plain. Wildlife losses will reduce potential hunting opportunities by 17,000 man-days. Only slight benefits from waterfowl hunting will occur on the reservoir projects.

The principal elements of our fish and wildlife plan considered for the Big Black Basin are as follows:

1. The multipurpose reservoirs proposed for construction in the early action plan will provide better distribution of fishing opportunities in the basin.
2. A diversity of fishing opportunities should be maintained by preservation and protection from channelization of certain select streams.
3. Improved access development on streams and natural lakes are needed to accommodate an increase in sport fishing, hunting, and commercial fishing use.
4. Suitable wildlife habitat associated with the proposed water development plans should be made available to the Mississippi Game and Fish Commission for intensive management to mitigate project induced wildlife losses.
5. The private sector should be encouraged to recognize the economic importance and other values to be derived by providing public hunting opportunities to help satisfy the critical needs for hunting in future years.
6. Intensified management and utilization of the public lands and wildlife management areas will be needed. Our agency report points out the public hunting potentials offered by the 16th section lands located in the basin.
7. In addition to the need for increased harvest of commercial fish from natural waters, the development of fish-farming operations in the basin may be required to satisfy the future demand for commercial fish production.

The opportunity to present this statement is appreciated.

Sincerely yours,



Walter A. Green
Regional Director

EXHIBIT E

SUMMARY REPORT NO. 5
Comprehensive River Basin Study
U. S. DEPARTMENT OF AGRICULTURE

Prepared for
Basin Coordinating Committee
Big Black River Basin
May 2, 1967

EXHIBIT E

Progress Report of the U. S. Department of Agriculture
to the
Basin Coordinating Committee
on the
BIG BLACK RIVER BASIN
May 2, 1967

I. Agricultural Economic Base Study

The Economic Research Service and Forest Service completed an agricultural economic base study of the Big Black River Basin in March 1965.

A brief summary of the data presented in Volume I includes an inventory and analysis of agricultural resources and output in the basin. These data state, in part, that the Big Black River Basin study area comprises approximately 4,339,700 acres. Of this amount, 2,264,417 acres makes up the physiographic drainage area of the basin as evaluated by USDA and as determined by the 1958 Conservation Needs Inventory data.

Agricultural uses of land account for 4,111,000 acres as compared to 228,700 acres devoted to other uses. Less than 1 percent of the total area is surface water. Of the land devoted to agricultural uses approximately 58 percent is forest land, 22 percent cropland, 15 percent pastureland and 5 percent other.

There were approximately 18,900 farms in the basin in 1959. This represents a decline of 10,414 from the 1954 level. An even larger decline was reported for 1949 and 1939. While the number of farms has been decreasing, the size of farms in the basin has been increasing during the past several decades.

The Big Black Basin is made up primarily of miscellaneous and cotton farms. These two types have accounted for more than 80 percent of the farms in the last three census years. Cotton-type farms represented 38 percent of all basin farms in 1959 and indications are that cotton-type farms will decline in relative importance in the future. Livestock farms are the third most important type of farming enterprise in the basin. The leading crops in 1959 in terms of acreage harvested were corn, cotton, hay, soybeans and oats respectively.

Livestock and poultry are also an integral part of agricultural resource use in the basin. Considerable area is used for pasture or grazing of livestock in addition to the sizeable acreage of cropland used to grow feed for animals. There were approximately 375,000 cattle and calves, 146,000 hogs and pigs, 35,000 other livestock in the basin in 1959. In addition, there were also approximately 855,000 chickens and 2,000 turkey hens kept for breeding in 1959.

Some basin farmers derived part of their farm income from the sale of forest products. Pulpwood and sawlogs are the two most important forest products sold. Farms, in addition, benefit from the use of forest products in their farm business. In 1959, approximately 1600 farms reported sales of forest products in the amount of \$1,373,000.

Hired labor is the largest selected farm expenditure and amounted to slightly over \$6,000,000 in 1959. Purchases of livestock and poultry and feed for livestock and poultry represented the second and third largest expenditures in 1959. Approximately \$5,100,000 was spent on the purchase of livestock and poultry and \$5,000,000 was spent for machine hire.

In 1959 approximately 81 percent of the basin farms reported using commercial fertilizer and the basin's use of fertilizer was estimated at approximately 76,000 tons.

The use of supplemental irrigation in the basin as a production practice is limited. In 1954 only 167 farms reported using irrigation on 6,498 acres, compared to 30 farms irrigating 3,176 acres in 1959.

Volume II of the Agricultural Economic Base Study includes projections of agricultural resources in production in the Big Black River Basin for the period 1980 and 2015.

The basin's total population has ranged from 170,000 to slightly over 300,000 from 1870 to 1960. The population was 242,000 in 1960 and is projected to be 248,000 in 1980. In 2015 the total population is forecast to be at a record high of 349,000. The urban portion of this population will increase substantially as well as the rural non-farm sector. The rural farm population, however, is expected to decline through 2015. The rural farm population was 71,000 in 1960 and is forecast to be 31,000 in 1980 and 23,000 in 2015.

A major factor affecting future agricultural production in some areas is the availability of land. Non-agricultural demands for land for such items as highway construction, airports, residential areas and recreational areas tend to reduce the agricultural base used for agricultural production.

Total cropland as well as harvested cropland is expected to decrease in acreage for both future time periods. Pasture and pastured cropland is expected to increase in each of these target years. The crop production in the basin is projected to de-emphasize cotton and corn and place more emphasis on soybeans and hay.

The structure of the agricultural industry in the basin has changed and is expected to continue in the future. Farming has become big business that requires a large capital outlay. It will become more difficult for small inefficient operators to compete with the larger, better organized units. Farmers are becoming more specialized and some are shifting their interest to production of different commodities.

The number of farms in the basin was 18,911 in 1959 and is projected to decrease to 8,800 by 1980 and 7,700 by 2015. The average size of basin farms was 176 acres in 1959. The average size is projected to be approximately 360 acres in 1980 and 380 in 2015.

The average net income per farm is projected to be \$4,800 in 1980 and approximately \$8,000 in 2015. Per capita farm income for 1980 and 2015 is about \$1,400 and \$2,700 respectively.

II. Water Management Analysis

A Water Management Analysis of the Big Black River Basin was completed by the Economic Research Service in June 1966.

The Soil Conservation Service had developed detail studies of water problems for areas within the basin which preliminary investigations indicate to be feasible for project development. However, no attempt has been made to aggregate the available data and develop an economic water management analysis and evaluation for the basin as a whole, irrespective of feasibility potentials.

An attempt has been made to measure the damages which are received through failure to alleviate the basin's water problems, namely overflow, inadequate drainage and drought. This analysis was undertaken without

regard to the feasibility or cost of alleviating these problems. Neither was consideration given to land use changes and land enhancement which might be generated with problem alleviation.

Open land in the floodplain was developed from information by the Soil Conservation Service and the Corps of Engineers. The estimated land in the floodplain provided by these two agencies was 485,600 acres. The Corps of Engineers estimated the main stem area with an overflow problem to consist of 42,500 acres of open land, and 164,000 acres of woodland. There is approximately 158,500 acres of open land and 120,000 acres of woodland in floodplain lands in the upstream portion of the basin.

Conservation Needs Inventory data developed in Mississippi in 1958 presented an estimate of 435,000 acres with a drainage problem and 142,000 acres of irrigable land in the basin. The inadequately drained area was estimated to consist of 248,000 acres of open land and 187,000 acres of woodland. The irrigable land area was estimated to consist of 51,000 acres of open land and 38,000 acres of woodland.

For purposes of ERS analysis the problem was considered to be 201,000 acres of open land with a flooding problem, 248,000 acres of open land with a drainage problem, and 51,000 acres of open land considered irrigable.

Damage to agricultural production caused by flooding is one of the major water management problems in the Big Black River Basin. The attempt here was not to evaluate the benefits which could be received from feasible flood control projects but to determine the total average yearly reduction in net income which occurs with present cropping patterns and farming conditions. The damage to agricultural production as a result of

inadequate drainage was also determined. This analysis did not evaluate the benefits which could be received from feasible drainage projects but attempted to determine the total average yearly reduction in net income due to inadequate drainage which occurs with present cropping patterns and farming conditions. In the Big Black River Basin the average annual reduction in income from flooding on open land is approximately \$1,300,000. The major part of this comes from damages to cropland. The average reduction in net income from cropland with an overflow problem is approximately \$21.00 per acre. The reduction in net income from inadequate drainage of open land is approximately \$1,600,000 annually. The reduction in net income by not using supplemental water on row crops during periods of drought is estimated to be approximately \$121,000 annually. The reduction in net income due to overflow, inadequate drainage or drought is approximately \$2,900,000 a year.

III. Interim Reports

Interim reports on upstream watershed control have been completed on four reaches in the Big Black Basin. There are 37 upstream watersheds in the basin. Each of these has been studied to some degree of detail to determine if they are physically and economically feasible watershed projects. Watersheds were classified as being economically feasible if the annual benefits from flood prevention were at least equal to the cost of those structural measures needed to reduce flooding in the watershed.

Seven watersheds have been planned and are in operation through the PL-566 Watershed Program. Within these seven watersheds 21 floodwater

retarding structures and 61 miles of channel improvement have been completed. There remains to be constructed 25 floodwater retarding structures and 108 miles of channel.

Preliminary indications are that 25 watersheds (over and above the 7 planned and in operation) have been classified as being economically feasible for the next 10 to 15 year period and 5 watersheds as being potentially feasible for the period beyond 1980.

Land treatment measures for all watersheds in the basin are needed on over 560,000 acres of open land and 750,000 acres of woodland.

Critical area measures are needed on 59,478 acres of openland, 19,900 acres of woodland and 1,175 miles of roadbanks need erosion control.

IV. The USDA Plan

The USDA Plan will be that all upstream watersheds determined to be physically and economically feasible will be recommended for Early Action implementation. The authority under which implementation for three watersheds is recommended is the Watershed Protection and Flood Prevention Act, PL-566, 83rd Congress as amended and special basin-wide authority for the remaining 22 watersheds. The three watersheds identified for authorization under PL-566 are Five Creeks Watershed in Yazoo County, Box Creek Watershed in Holmes County, and Apookta Creek Watershed in Attala County. The first draft of the watershed work plan on Five Creeks Watershed was recently completed.

The acres in the seven watersheds that have been planned and in operation are 281,810, the acres of the three watersheds to be recommended

for PL-566 authorization are 188,660, and the acreage for the 22 watersheds that will be recommended for implementation through basin-wide authorization are 1,432,197. There are 361,750 acres in the five watersheds that are potentially feasible.

Land treatment measures were considered as a basic element in formulating all watershed projects and are essential if each is to function properly. These measures are to be planned and applied by individual farmers in cooperation with the respective Soil Conservation Districts in which the watershed occurs. The cost of land treatment measures for watershed protection will be non-Federal while the cost of critical area measures will be cost-shared by non-Federal and Federal interests. The estimated amounts of land needing treatment during the installation period for the 22 watersheds are cropland, 178,647 acres; grassland, 160,184 acres; wildlife lands, 82,885 acres; and woods, 644,111 acres. Grasses and legumes will be planted on 15,780 acres of land as a critical area treatment and over 737 miles of roadside will be treated for erosion control, and 41,130 acres of critical area plantings will be in woods. The total estimated cost for land treatment measures for the 22 watersheds is \$18,408,529.

Floodwater retarding structures was the first choice of structural measures in formulating a plan to reduce flooding in upstream watersheds. There are 137 floodwater retarding structures planned for the 22 watersheds and the estimated cost of installation will be \$14,703,985.

Improvement of stream channels was the second combination of structural measures planned for further reduction in floods and damages to floodplain

lands in upstream watersheds. Channel improvement consisted of snagging and shaping, clearing and snagging and channel enlargement or excavation. Cut-offs and realignment of channels were practically non-existent. Approximately 707 miles of channel improvement are planned for the 22 watersheds and the estimated total cost of installation is \$7,494,970.

Recreation as a project purpose was planned in 12 watersheds. This does not include one multiple-purpose structure for flood prevention and recreation in Long Creek Watershed in Attala County which has been approved for operations. In addition to water storage, basic facilities are to be installed for each structure. Basic facilities will include, but not necessarily be limited to, access roads, boat ramps, swimming beaches, camping and picnicking grounds, electric power, domestic water, and the necessary associated features to provide a well developed, highly attractive outdoor recreation facility. The 15 multiple-purpose structures for flood prevention and recreation are planned for installation in the 22 watersheds at a total estimated installation cost of \$3,700,401.

The total annual benefits from flood prevention and recreation is \$2,536,940. This does not include an estimated annual benefit of approximately \$400,000 that will accrue on the main stem floodplain from proposed works of improvement in upstream watersheds. The average annual cost for flood prevention and recreational facilities is \$1,277,393, for a benefit to cost ratio of 2.0 to 1.0. More than 155,151 acres of floodplain land will be benefited from proposed structural measures in upstream watersheds.

V. Conclusions and Recommendations

The Plan as will be described in the USDA Report is considered the most practical and economically feasible to meet the present and future

needs in upstream watersheds for flood prevention and planned outdoor recreation. The benefit to cost ratio is greater than 1:1 for each watershed. Watershed projects have been coordinated with other agencies and no conflict of interests in projects exist. Local interests will provide the required cooperation necessary in the implementation and construction of works of improvement to be installed. The USDA Field Advisory Committee will recommend that the 22 watersheds as previously identified be authorized for construction through special legislation essentially in accordance with the USDA Plan.

The estimated cost of installing land treatment measures for watershed protection and critical area treatment is \$19,449,347. The estimated cost for installing 137 floodwater retarding structures, 8 multiple-purpose structures, with basic facilities, and 7 multiple-purpose structures without basic facilities, and 707 miles of channel improvement is \$27,554,282. Total project costs is estimated to be \$48,075,915.

Prior to construction of any works of improvement in any of these watersheds, legally constituted Water Management Districts will be organized to furnish assurance to the Secretary of Agriculture that they will meet the requirements of local interests in their share of the installation cost, obtaining necessary easements and rights-of-way and in the operation and maintenance of works of improvement to be installed and as outlined in a detailed watershed work plan and work plan agreement.

The total annual benefits from flood prevention and recreation is estimated to be \$2,536,940. The average annual cost is estimated to be \$1,277,393 with a benefit to cost ratio of 2.0 to 1.0.

EXHIBIT F

THE BIG BLACK RIVER BASIN *Development Association*

Counties Can Speak Through A Basin District

OFFICERS AND
BOARD OF DIRECTORS

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SIDNEY BRANCH. WINONA
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W. H. MCKENSIE. JR.
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RICHARD PARKER
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RICHARD HASTINGS
PORT GIBSON
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STEVE BIGGERS
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T. H. KENDALL. III
BOLTON
F. E. BRASFIELD. SR.
EDWARDS
WAYNE JOHNSON
MANTEE
PASCHAL HODGES
EUPORA
CLARENCE MORGAN
KOSCIUSKO
B. H. MAXWELL. JR.
PICKENS
W. R. FERRIS
RT. 1. VICKSBURG
F. H. EDWARDS
CANTON
JOHN SHARP HOWIE
BENTON
EVERITT HARRISS
VICKSBURG
W. C. NEILL
NORTH CARROLLTON
CAMPBELL GUION
RT. 2. BENTONIA
JOE FRED BROOKS
RT. 2. MATHISTON

CORPS OF ENGINEERS
VICKSBURG, MISSISSIPPI 39180

BIG BLACK RIVER, MISSISSIPPI
COMPREHENSIVE BASIN STUDY

Recognizing that water is our most precious natural resource and is ⁱⁿinnumerable ways a vital part of our everyday lives, the Big Black River Basin Development Association has as its objectives the conservation, utilization and development of the water resources of the Big Black River Basin.

In attempting to attain these objectives we realize that there is no single "best" way to develop a river basin, but rather a number of alternatives with varying and complex effects upon water, soil, plants, and human activity.

We further realize that in order to make a sound approach to water resources development in the Big Black River Basin we must (1) identify these alternatives, (2) analyze them in relation to water-use decisions of the past and (3) to the best of our ability project this analysis into the future.

You have accomplished this in the study presented today. We highly commend all of the agencies participating in this study for your diligent efforts in making it as meaningful as possible. The services you have rendered are in our opinion of inestimable value.

THE BIG BLACK RIVER BASIN *Development Association*

Counties Can Speak Through A Basin District

OFFICERS AND BOARD OF DIRECTORS

•
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VICKSBURG
W. C. NEILL
NORTH CARROLLTON
CAMPBELL GUION
RT. 2. BENTONIA
JOE FRED BROOKS
RT. 2. MATHISTON

We know that the study presented by you today is not a final plan; it is one step in a continuous planning operation. However, it is the basis or foundation upon which to build our water resources development and without which our program would be severely handicapped.

Our efforts at present are toward creating the Big Black River Basin Development Districts, an agency of the State of Mississippi. It will be representative of the local populace residing within the Big Black River Basin and will be empowered with the authority to plan, coordinate, and implement a comprehensive development program.

To this end we pledge our continued efforts (and urge that you direct yours) toward implementing a program of water resource development in the Big Black River Basin through a coordinated basinwide approach.

Sincerely,
Sidney Branch
Sidney Branch, Vice-President
Big Black River Basin Development Assn.

EXHIBIT G

Hinds County SCD
502 North Street
Jackson, Mississippi 39202
May 15, 1967

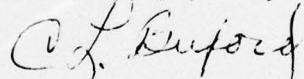
Colonel Felix R. Garrett
District Engineer
Corps of Engineers
Vicksburg, Mississippi 39180

Dear Colonel Garrett:

On May 9, 1967, our Hinds County Board of SCD Commissioners met and discussed proposed Works of Improvements in the Big Black River Basin. We are very much interested in the small Watershed Program and improvements along the main stem of the river.

Our Board went on record favoring a letter to you to include in the Works of Improvement, improvement of the main channel, which we feel will greatly improve our agricultural lands in the western side of Hinds County.

Very truly yours,



C. L. Buford, Chairman
Hinds County SCD

EXHIBIT G

EXHIBIT H

**TOWN OF PICKENS
MISSISSIPPI**

PICKENS, MISS.

May 8th 1967

Colonel Felix R Garrett
Corps.of Engineers
Vicksburg District
Vicksburg, Mississippi

Dear Sir:

Re:-Big Black River Development Disct.

At the meeting relative to the above Project held at Canton, Mississippi, May 4th 1967. I called attention to the Paper Mill now located in Pickens, Mississippi. I stated at that time I had just been advised by Mr. Stephen Dunne of The Economic Development Administration, Department of Commerce, Washington, D.C. that a contract for the sale of the Plant had been signed with Burrows Paper Mills, Little Falls, New York.

Since that time I have talked with Mr. Ralph Burrows, Persident of the Company. He tells me that they have plans now to double the capacity of the Plant within two years. At the present time they have no plan for installing a Pulp Mill, but would like to have the right to do so in the future.

We would like to enter our protest to any plans for the Development of The Big Black River Basin that would preclude us from operating our existing Paper Mill as it now is or as it may be expanded in the future.

Tours very truly

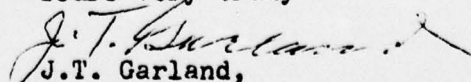

J.T. Garland,
Mayor
Town of Pickens, Mississippi

EXHIBIT H

JTG/m

EXHIBIT I

Edwards, Mississippi
May 15, 1967

Colonel Felix R. Garrett
District Engineer
Corps of Engineers
Vicksburg, Mississippi 39180

Dear Colonel Garrett:

Our Big Black River Basin Association has had a series of meetings in the various counties embraced in the Watershed. We are quite concerned about proposed Works of Improvement and urge that you consider channel improvements along the main stem of the river so that we will have adequate outlets needed in this County.

A good portion of my individual farming land is along the bank of the Big Black River, and I am personally concerned about this matter and urge your immediate attention on the channel improvement job.

Very truly yours,

F. E. Brasfield

F. E. Brasfield, Director
Big Black Development Association

EXHIBIT I

EXHIBIT J

SHELBY ROG CHAIRMAN
JACKSON, MISS

ROBERT E. FOSTER, COMPTROLLER

W. A. BILBO

MAGNOLIA, MISS

PRIM HAYNES

BELMONT, MISS

WILL A. HICKMAN

OXFORD, MISS

WALTER WILLIAMS

CLARKSDALE, MISS

G. A. LATIL JR. VICE CHAIRMAN

BIDLEY, MISS

MILTON McMULLAN, SECRETARY

NEWTON, MISS



STATE PARK SYSTEM

1102 WOOLFOLK BUILDING • JACKSON, MISSISSIPPI

May 5, 1967

Colonel Felix R. Garrett
District Engineer
U.S. Army Engineer District
Vicksburg Corps of Engineers
P.O. Box 60
Vicksburg, Mississippi 39180

Dear Colonel Garrett:

The Mississippi Park System appreciates the opportunity of attending the public hearings on the Big Black River Comprehensive Basin Study held at Winona and Canton, Mississippi.

The Park System is interested in and has a function relative to Outdoor Recreational needs now and for the future. We are striving to obtain the latest information of the present supply, potential sites and the demands of our citizens and visitors.

We would, therefore, request that the Mississippi Park System be advised of any information the Vicksburg Corps of Engineers may obtain relative to Outdoor Recreation that may be helpful in our day-to-day and long-range planning.

If the Park System can be of service to the Corps of Engineers in this regard, please feel free to call us.

Sincerely,

Rae Sanders
Coordinator
Bureau of Outdoor Recreation

RS:wm

EXHIBIT J

FISHING • SWIMMING • BOATING • PICNICKING • VACATION CABINS • GROUP CAMPING • HIKING
TENT AND TRAILER CAMPING

EXHIBIT K

J. T. THOMAS, III, PRESIDENT
CRUGER, MISSISSIPPI

MRS. J. R. LIPSEY, SECRETARY

RAY E. JOHNSON, SERVICE AGENT
BOX 388, LEXINGTON, MISSISSIPPI

HOLMES COUNTY FARM BUREAU

P. O. BOX 388 - OFFICE PHONE 455

LEXINGTON, MISSISSIPPI 39095

May 12, 1967

Colonel Felix R. Garrett
District Engineer
U. S. Army Engineer District
Vicksburg Corps Of Engineers
P. O. Box 60
Vicksburg, Mississippi 39180

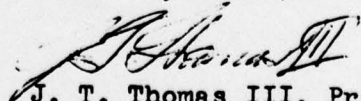
Dear Colonel Garrett

Representatives of the Holmes County Farm Bureau were present at the public hearings on the Big Black river Comprehensive Basin Study in Winona on May 2nd, 1967 and Canton on May 4th, 1967. After hearing the proposals by representatives of the Corps of Engineers, we would like to go on record favoring these proposals.

The Holmes County Farm Bureau is vitally interested in Mississippi agriculture and we believe River Basin Development can give a real boost to this phase of our economy. We feel that such a program as outlined in these public hearings would prove beneficial to all the people within this watershed.

The Holmes County Farm Bureau heartily endorses the proposals made by the Corps of Engineers, and we are ready to lend our support in carrying out this program.

Sincerely Yours,


J. T. Thomas III, President
Holmes County Farm Bureau

JTT/mjl

EXHIBIT K

EXHIBIT L

P. O. Donald 4
Lexington, Mississippi 39095
May 12, 1967

Colonel Felix R. Garrett
District Engineer
U.S. Army Engineer District
Vicksburg Corps of Engineers
P.O. Box 60
Vicksburg, Mississippi 39180

Dear Colonel Garrett:

The Big Black Farmers Club went on record at their regular monthly meeting held at Holmes Junior College, Goodman, Mississippi, in favor of the consideration being given by the Corps of Engineers in making the Comprehensive Basin Study of the Big Black River. Several members of the Club attended the hearings in Winona and in Canton on May 2nd and May 4th respectively.

After hearing the discussions by the representatives of the different groups making this study, the Big Black Farmers Club representatives at these hearings were in favor of the basic concept of these proposals. The Club's membership in the main own property that would be affected by the different programs outlined in connection with this project. It was the unanimous feeling of the Club membership that these proposals should be completely studied and that the work necessary to effectually control the Big Black River during flood stage and to afford proper drainage and recreational facilities and other benefits should be given every consideration.

The Big Black Farmers Club wants to thank the Corps of Engineers and other participating agencies for all of the work that has been done thus far in making this study. We stand ready to be of any aid and assistance we can in completing this project.

Sincerely yours,

BIG BLACK FARMERS CLUB

By: *E. W. Hooker*

E. W. Hooker

J. B. Majure
J. B. Majure
Committee

cc: Mr. Charles U. Donald
President, Big Black Farmers Club
Goodman, Mississippi

EXHIBIT L